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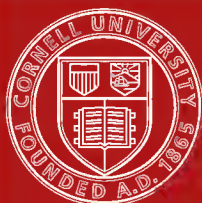
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Observations upon the topography & clima



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OBSERVATIONS
UPON THE
TOPOGRAPHY & CLIMATE
OF
CROWBOROUGH HILL, SUSSEX,

TOGETHER WITH OTHER SUBJECTS OF COLLATERAL INTEREST.

BY
Charles LEESON PRINCE,

*Member of the Royal College of Surgeons ; Fellow of the Royal
Astronomical and Meteorological Societies ; Member of the
Scottish Meteorological Society, &c.*



Ex tempestatibus verò optimæ æquales sunt, sive frigidæ, sive calidæ ; pessimæ
quæ maximè variant.

CELSUS.

LEWES : H. W. WOLFF, 64, HIGH STREET.

1885.

THE OBSERVATORY IS SITUATED IN

East Longitude	0° 9' 30 sec.		
East Longitude	0° 0' 38" (in time)		
North Latitude.....	51° 3' 14"		
Terrestrial Observatory	840 feet above sea level		
Astronomical Observatory	825	„	„
Thermometer Stands	780	„	„
Rain Gauge	777	„	„

INTRODUCTORY REMARKS.

THERE cannot, I think, be any doubt that in addition to the various fashionable health resorts on the coast of England there exist some inland positions, of equal health value, to which public attention should be directed ; but in the outset of our inquiries, it too frequently happens that we are unable to obtain any reliable statistics of their climate, soil, water supply, &c. In the hope of giving some information upon these all-important considerations with reference to Crowborough Hill, in the county of Sussex, now advancing into public notice and approval on account of its climatic advantages and splendid position in a southern county, I will endeavour in the following pages to give such details of its peculiarly favourable atmospheric conditions as will render it possible, both for the medical profession and the actual invalid, to have such a knowledge thereof, as will enable them to recommend, or decide upon, either a temporary or permanent residence in its neighbourhood.

C. L. P.

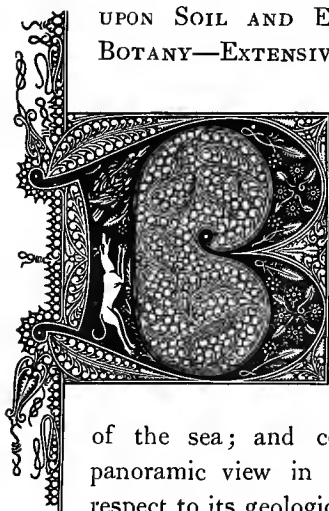
“Mannes eye is pleased in the beauteous light,
Bred forth of Phebus bright arysing rayes,
But more the mynd by taking inward sight,
Of that chief consolation of his dayes,
Sweet soule=enriching=knowlege reasōs guest;
Which doth distinguish mā from brutish beast.

Endebour then to know what may bee known,
To ignorance permit not any place,
Let never tyme transporte what is our owne,
Let wit and learning hold him stil in chase;
Let travail search, let searching lastly fynde,
Let fynding please the kynd accepting mynde.”

R. B.

CHAPTER I.

GEOLOGY — TOPOGRAPHY — TEMPERATURE DEPENDENT
UPON SOIL AND ELEVATION—WATER SUPPLY—
BOTANY—EXTENSIVE VIEWS.



Y the district of Crowborough is meant that portion of the county which is situated upon and around Crowborough Hill, or, as it was formerly called, Crowborough Beacon. The highest point is situated nearly 800 feet (796) above the mean level of the sea; and commands the most extensive panoramic view in the South of England. With respect to its geological character, it will be desirable to give an account of the Weald of the South-East of England, and for this purpose I will quote the excellent description of the same given by W. Topley, Esq., in his work on the "Agricultural Geology of the Weald," very nearly in the centre of which Crowborough Hill is situated: "The Weald may be described, in general terms, as consisting of a central undulating region of great extent, within which nearly every variety of soil occurs. The beds underlying this tract are the lowest of the series (Hastings Beds);

they dip or incline outwards in all directions, and pass under the next division of the Weald Clay, which forms a flat country passing all round the Hastings Beds, excepting where it, like all other divisions, is cut off by the coast line. This Clay passes under the Lower Greensand, which is always associated with rising ground, and generally with a steep slope or 'escarpment.' The soils on this formation are generally light ; it passes under the Gault, which forms a narrow zone of clay underlying the lighter sand of the Upper Greensand. The highest bed of the cretaceous series is the Chalk, which overlooks the inner country in a fine escarpment, passing completely round the district, broken only by narrow valleys through which the rivers escape. The crest of the Chalk escarpment is, in Kent and Surrey, a tolerably uniform flat, varying in height from 500 to nearly 900 feet. In Sussex and Hants it is more varied in outline ; the highest point is Butser Hill, south of Petersfield, 882 feet. The Lower Greensand country is generally of much less elevation than the Chalk, but in the western part of Surrey it attains the height of 967 feet at Leith Hill. The highest point in the central country is Crowborough Beacon, in Ashdown Forest. The chief characteristic of the climate of the district is an excessive rainfall. This is partly attributable to the height of the country, and partly to its proximity to the Southern Coast, which has a rainfall varying from 40 inches, in Cornwall and Devon, decreasing eastwards to 30 inches in Hants, and 29 inches at Hastings."

Again, at page 20, Mr. Topley says, in reference to the Hastings Beds, upon which Crowborough is immediately situated : "Most people who are personally unacquainted with the Weald have an idea it is all, or chiefly, a stiff soil. This is true of the Weald Clay flat, but not of the inland

and upland country of which we have now to speak. Considerably more than half is light sand. Indeed, the name until lately used for the rocks of this district has been 'Hastings Sands.' This was misleading, as they contain somewhat thick beds of clay. Another erroneous notion, commonly held, is that the Weald is a valley; we frequently read of the 'Valley of the Weald.' Again this is true of the Weald Clay, but wholly false if the term 'Weald' includes, as of course it does, the central area. Whenever the Hastings Beds crop out from under the Weald Clay they do so with gently rising ground, not a steep slope. This rise continues towards the centre of the country until the ground attains heights considerably over the average elevation of the Lower Greensand. These chief points are Crowborough Beacon, Brightling Down, Fairlight Down, all in Sussex; Goudhurst, in Kent."



CROWBOROUGH has lately been formed into a new ecclesiastical district, within the parish of Rotherfield, and forms the principal part of its western side. The parish itself is bounded to the S.W., W., and N. by the parishes of Buxted, Withyham, and Frant, and to the eastward by Mayfield. Tunbridge Wells, Mayfield, and Uckfield are each distant about seven miles from Crowborough.

Situated upon high ground, the district is exposed occasionally to high winds, but these are, for the most part, less in force than at points situated 150 or 200 feet lower. The strong S.W. and N.E. are frequently more disposed to sweep

round the hill than to pass over its summit. The temperature, as may be ascertained by subsequent tables, is remarkably equable, and conforms probably to that of other localities of equal altitude and latitude. It is a general but very erroneous idea to suppose that, in severe weather, the hill tops are colder than the valleys. As an instance of this I will quote the quaint remarks of Gilbert White upon this subject in a letter to the Hon. Daines Barrington.

“On the 10th, at eleven at night, though the air was perfectly still, Dollond’s glass went down to *one degree below zero!* This strange severity of the weather made me very desirous to know what degree of cold there might be in such an exalted situation as Newton. We had, therefore, on the morning of the 10th written to Mr. —, and entreated him to hang out his thermometer, made by Adams; and to pay some attention to it morning and evening, expecting wonderful phenomena in so elevated a region at two hundred feet or more above my house. But behold! on the 10th, at eleven at night, it was only down to 17° , and the next morning at 22° , when mine was at 10° ! We were so disturbed at this unexpected reverse of comparative local cold, that we sent one of my glasses up, thinking that of Mr. — must, somehow, be wrongly constructed. But, when the instruments came to be confronted, they went exactly together; so that, for one night at least, the cold at Newton was eighteen degrees less than at Selborne; and, through the whole frost, ten or twelve degrees; and indeed, when we came to observe the consequences we could easily credit this: for all my laurustines, bays, ilxes, arbutuses, cypresses, and even my Portugal laurels, and (which occasions more regret) my fine sloping laurel hedge were scorched up; while at Newton the same trees have not lost a leaf!”

In this county, especially, the variations of climate would

appear to be dependent upon the numerous local elevations, undulations, and depressions which are found to exist at places nearly adjacent. The general character of the soil, too, has an important influence. Some varieties, as the gravelly and sandy loam, absorb heat from the sun's rays with remarkable rapidity, and radiate the same at night to an equal or even greater degree, causing thereby a large diurnal range of temperature—a serious disadvantage to any locality. Other soils in the county have a less amount of sand, as the Ashdown series of the Hastings Beds, which are not so sensitive, and enjoy a far more equable temperature. Again, there are some clay soils which by their close retention of moisture and less radiating properties are, for the most part, cold, damp, and but slightly affected by the sun's rays, except in periods of unusual drought.

Although the temperature of the air on elevated ground is frequently colder at *mid-day* than that of the valley, yet the relatively warm temperature of the former position, at *night*, is an ample compensation. On cloudless nights, when radiation is at its maximum in the valley, the temperature on the hill will be from 10° to 12° higher.

One of the most striking features of the annual temperature on high ground is the small daily range, or the difference between the highest temperature during the day and greatest cold during the night, and subsequent tables will prove, I think, that in point of equability of temperature Crowborough will compare very favourably with the most popular health resorts in the kingdom. Of what vital importance this condition of the air is to the invalid, labouring under any chronic disease of the respiratory organs, I need not enter upon. Let it suffice to say that cases of endemic consumption are rare.

The climate appears to be more especially applicable to

many diseases of the respiratory organs, as well as to those arising from nervous depression, general languor and debility of the system, whether arising from dyspepsia, hysteria, residence in foreign climates or remittent and typhoid fever. In all these cases it will be found, for the most part, that the delightful and extensive scenery, the open, airy, and vivifying atmosphere, abounding in ozone, together with a numerous retinue of natural attractions in the vicinity, all contribute to secure to the visitor that measure of health which generally follows the due co-operation of an active body with a cheerful and contented mind.

The numerous springs which rise to the surface in ordinary seasons, at many points on the Hill, render the water supply abundant, and of good quality. Upon occasion of unusual drought some of the artificial wells become exhausted, but the two chief public springs are never known to fail.

The average depth of the wells is from twenty to thirty feet—some much less—and they yield, for the most part, a sufficient quantity for domestic purposes. It would be a comparatively easy undertaking to establish water works upon the upper ground, having a reservoir sufficiently large to ensure to all a constant supply of the needful element. There are also some strong chalybeate springs oozing from various slopes on the waste lands, which could be made available for medicinal purposes, as they contain a large proportion of the ferruginous salts.

The subsequent meteorological tables will, I trust, be found useful both for present and future data of information. The observations have been carefully taken with duly certified instruments placed four feet above the surface of the ground and comprise an unbroken series of eleven years. Those taken by fully exposed instruments are, I believe, unique, for so long a series, in this country. The protected instru-

ments were placed in a "Stevenson's Stand," as that particular form of enclosure is the one recognised by the Meteorological Societies of England and Scotland. The results obtained are useful by way of comparison with instruments placed under similar circumstances. This stand, however, is not so efficient as it ought to be. In the first place its cubical contents are much too small, and secondly, although it is provided with a double louvre boarding laterally, yet snow will sometimes pass through the interstices and completely cover up the thermometers.* The trees which appear to flourish the most luxuriantly are the several varieties of the coniferæ, as well as the oak, beech, holly, and sycamore. I will not attempt the botany of the district, which differs but little from that in the neighbourhood of Tunbridge Wells, but I will mention a few somewhat rare plants which may be found here, viz., *Drosera rotundifolia*, *cuscuta europæa*, *gentiana pneumonanthe*, *genista pilosa* and *tinctoria*, *campanula hederacea* and *rotundifolia*, *hypericum elodes*, *malaxis paludosa*, *cotyledon umbilicus*, *ulex nana*, *polygala* (three varieties), *lysinnachia nemorum*, *mentha pulejuni*, *erythræa pulchella*, *solanum dulcamara*, *anagallis tenella*, *bartsia odontites*, *hyoscyamus niger*, *myosotis palustris*, *vinca minor alba*, *symphytum officinale*, *habenaria bifolia*, *listera ovata*, &c. The following ferns may also be found, viz., *Polypodium vulgare*, *aspidium filix mas* (two varieties), *A. filix fœmina* (two varieties), *Lastræa oreopteris*, and *dilatata*, *polysticum angulare*, *osmunda regalis*, *blechnum boreale*, *asplenium adiantum nigrum*, *ruta muraria*, *botrychium lunaria*, *cystopteris fragilis* and *scolopendrium vulgare*.

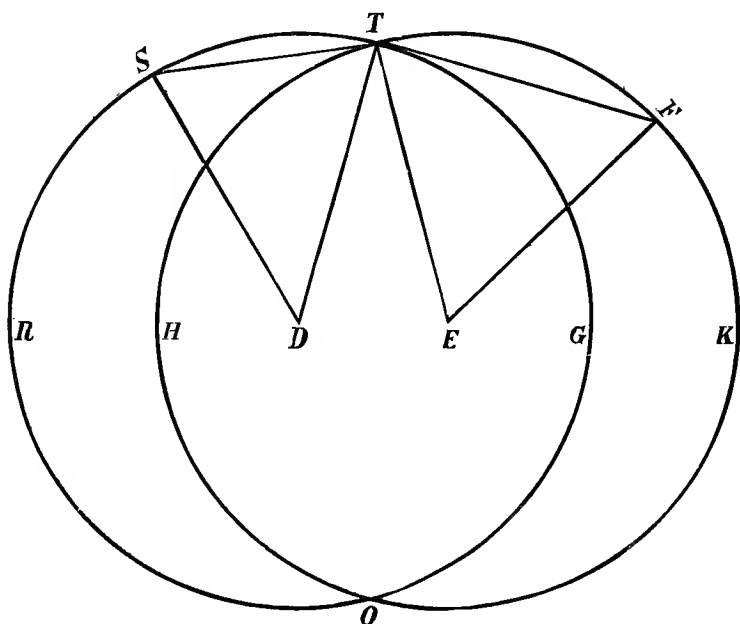
I have previously mentioned the extensive view which Crowborough Hill commands; and I think that, so far as I can learn, it is probably the most extensive in the South of

* For some further remarks upon this subject see next chapter.

England, if not in the kingdom ; in proof of which I purpose giving a list of the various parish churches and other objects which, on clear days, may be seen from the Observatory, together with their respective bearings, the Tower on Saxonbury Hill being taken as the zero point.

I need, perhaps, scarcely remark that a telescope of moderate power will be required to identify the more distant points, but many can be seen with a good opera glass when their exact direction is known. It is not usually a very easy matter to identify an object twenty or thirty miles distant, and I will therefore describe the method which I have adopted for this purpose and found most satisfactory.

Our first care must be to ascertain, with great exactness, our own position on the ordnance map, and to enable us to accomplish this preliminary, the following construction is employed, which, if accurately worked out, will establish the precise point at once :—



The letters S. T. F. in the above diagram refer to three objects which are easily seen from my Observatory, viz., Saxonbury Tower, Ticehurst Church, and Fuller's Needle, and the method of proceeding will be as follows :—

Let the angular distance of the observer's station between Saxonbury and Ticehurst be 22° , and that between Ticehurst and Fuller's Needle 29° . Join S. T. and T. F. Then upon the base S. T. describe an isosceles triangle S. D. T. having the angle at its apex $D=44^\circ$ (*i.e.*, twice 22°). And upon the base T. F. describe an isosceles triangle T. E. F. having the angle at the apex $E=58^\circ$ (*i.e.*, twice 29°). Also with the centre D and radius D. S. or D. T. describe the circle S. R. O. G. : and with centre E. and radius E. T. or E. F. describe the circle H. O. K. F. These will obviously intersect at O., and this intersection will show, with great accuracy, the observer's position on the map.

In proof of the truth of this construction let us refer to Euclid 3, XX., where we find that "The angle at the centre of a circle is double of the angle at the circumference, upon the same base, that is, upon the same part of the circumference." Hence the point at which S. T. subtends an angle of 22° must be on the circumference of the circle S. R. O. G., and for the same reason the point at which T. F. subtends an angle of 29° must be on the circumference of the circle H. O. K. F. These, though, are one and the same point which can therefore only be at O., where the circles intersect, and thus must represent the observer's *exact* position with reference to the three above mentioned objects.

Having thus ascertained the various angles required, and proved by actual observation that they are correct, we take a copy of the same upon tissue paper, on the same scale as our map, and place it over the three selected objects on it; then making a fine puncture through the point marked O, such

puncture will mark our true position. The next step will be to ascertain, as nearly as possible, either our meridian line, or to select some conspicuous land object as our zero point; and mark it *as such* upon our map. Then from the observer's position, on the said map, we describe a circle of not less than twenty inches in diameter which shall be graduated into 360° . We now drive a strong pin into the point "O" which marks our Station, and loop over it a thread which shall be long enough to reach to the border of our map. The most important instrument now required is a good theodolite, which must be adjusted upon Saxonbury Tower, which we make our zero point. Having done this we may turn it upon an unknown object, and having taken its reading upon the theodolite, must refer to the same degree of azimuth on the map. Then taking the thread in our hand and stretching it through the same degree, on the map circle, to the edge of the map, we look carefully along the thread, and shall doubtless find the church or any other object for which we are seeking. It was by this means that I was able to identify all the points mentioned in the subjoined list, which were previously unknown to me.



UCH churches and other objects mentioned in the subjoined list have all been seen on favourable occasions from the Observatory. Some are visible only when the atmosphere is unusually clear, as sometimes occurs at intervals between showers; others under different conditions of light and shade; while a few can be seen during the winter months, *only*, when the foliage is absent.

Starting, then, from Saxonbury Tower, I commence the identification of distant objects by proceeding towards the South, West, and North, until the circle has been completed; the degrees and minutes refer to the distance of the several objects from Saxonbury.

Saxonbury Tower	...	...	...	...	0° 0'
Goudhurst Church	...	...	...	...	1° 48'
Sissinghurst Do.	...	...	...	...	6° 48'
Noviciate, Wadhurst	...	...	...	...	9° 6'
Wadhurst Castle...	...	...	...	...	13° 40'
Markcross Church	...	...	...	...	13° 56'
Hcmsted House ...	...	...	...	...	14° 21'
Wadhurst Church	...	...	...	...	14° 30'
Bestbeech Hill, Wadhurst	...	...	...	...	14° 54'
Benenden Church	...	...	...	...	16° 38'
Markcross Orphanage	...	...	...	...	17° 50'
St. Augustine's, Ticehurst	...	...	...	...	19° 42'
Highgate Church, Hawkhurst	...	...	...	...	20° 47'
Ticehurst Do.	...	...	...	...	21° 59'
Stone Do.	...	...	...	...	25° 26'
Lydd Do.	...	...	...	...	26° 52'
Sandhurst Do.	...	...	...	...	27° 21'
Stonegate Do.	...	...	...	...	28° 21'
Hurst Green Village	...	...	...	...	29° 10'
Rotherfield Church	...	...	...	...	29° 14'
Iden Do.	...	...	...	...	30° 21'
Bodiam Do.	...	...	...	...	30° 22'
Pennybridge Orphanage	...	...	...	..	31° 18'
Northiam Church	...	...	...	...	31° 29'
Silverhill Windmill	...	...	...	...	32° 21'
Etchingham Church	...	...	...	...	33° 3'

Salehurst Church	...	...	...	...	35°31'
Robertsbridge Village	...	...	...	...	37°20'
Burwash Church	...	...	...	...	39°51'
Rotherfield Rectory	...	...	...	...	40°24'
Brede Church	...	...	...	...	42°10'
Convent Tower, Mayfield	...	...	...	...	44°41'
Sedlescombe Church	...	...	...	...	44°42'
Mayfield Do.	...	...	...	...	45°13'
Mountfield Do.	...	...	...	...	45°25'
Rotherhurst	...	...	...	...	45°28'
Pett Church	...	...	...	...	45°32'
Burwash Common Church	...	...	...	...	48°42'
Fairlight Down Do.	...	...	...	...	48°57'
Fuller's Needle	...	...	...	...	51°5'
Brightling Observatory	...	...	...	...	52°15'
Fuller's Folly	...	...	...	...	55°31'
Dallington Church	...	...	...	...	58°47'
Heathfield Tower	...	...	...	...	70°38'
Martello Tower No. 67	...	...	...	...	86°58'
Hailsham Church	...	...	...	...	90°3'
Possingworth House, Waldron	...	...	...	...	90°18'
Christ Church, Eastbourne	...	...	...	...	91°29'
Waldron Church	...	...	...	...	92°25'
St. Saviour's Do., Eastbourne	...	...	...	...	93°35'
Hadlow Down Do.	...	...	...	...	94°31'
Meads Do., Eastbourne	...	...	...	...	95°14'
Willingdon Do.	...	...	...	...	95°26'
Polegate Do.	...	...	...	...	95°40'
Chiddingly Do.	...	...	...	...	99°28'
Dicker Do.	...	...	...	...	99°53'
Arlington Do.	...	...	...	...	103°13'
Wilmington Do.	...	...	...	...	103°53'

East Hoathly Church	...	...	...	...	107'30
Alfriston Do.	...	...	...	...	108'53
Chalvington Do.	...	...	...	...	108'57
Berwick Do.	...	...	...	...	109'22
Rype Do.	...	...	...	...	110'21
Selmeston Do.	...	...	...	...	111'25
Alciston Do.	...	...	...	...	112'20
Firle Tower	...	...	...	...	118'31
Laughton Place	...	...	...	...	119'21
Framfield Church (Roof)	...	...	...	...	120'8
High Cross, Framfield	...	...	...	...	120'28
Little Horsted Church	...	...	...	...	129'43
Buxted Do.	...	...	...	...	130'11
Horsted Place (Tower)	...	...	...	...	130'29
Ringmer Church	...	...	...	...	131'0
Uckfield Do.	...	...	...	...	134'53
The Castle Keep,	} Lewes.		...	...	136'48
St. John's Church,			...	...	136'52
St. Ann's Do.			...	...	137'40
Hamsey Do.	...	...	...	...	138'58
Offham Do.	...	...	...	...	142'18
Maresfield Do.	...	...	...	...	146'36
Plumpton Do.	...	...	...	...	153'30
Newick Do.	...	...	...	...	154'12
Fletching Do.	...	...	...	...	161'3
Ditchling Do.	...	...	...	...	161'50
Maresfield Do. (on Forest)	...	...	...	...	162'37
Keymer Do.	...	...	...	...	163'28
Devil's Dyke House	...	...	...	...	163'38
Forest Lodge, Maresfield (Trees at Gate)	...	...	...	...	165'42
Bramber Church	...	...	...	...	169'47
Hurstpierpoint Do.	...	...	...	...	170'7

Burgess Hill Church	...	...	...	...	171°45 ⁰
Searles, Fletching	...	...	...	...	171°47
Chanctonbury Ring	...	...	...	...	174°48
Henfield Village	...	...	...	...	175°10
Hayward's Heath Asylum	...	...	...	...	177°48
„ „ Church	...	...	...	...	181°14
Cowfold Monastery Do.	...	...	...	...	183°25
Cuckfield Church	..	...	...	...	185°10
Lindfield Do.	...	...	...	...	185°26
Dane Hill Do.	...	...	...	...	186°45
Broadwood's Tower, Surrey	...	...	...	...	206°22
West Hoathly Church	...	...	...	...	209°25
Selsfield Lodge	...	...	...	...	213°40
Turner's Hill Village	...	...	...	...	218°10
Leith Hill (Tower)	...	...	...	...	220°0
Burstow Church...	...	...	...	...	229°48
Eastgrinstead Do.	...	...	...	...	234°30
Redhill Do.	...	...	...	...	239°42
Ashdown House...	...	...	...	...	239°54
Hammerwood Church	...	...	...	...	252°45
Hartfield Do.	...	...	...	...	260°15
Crockham Hill Do.	...	...	...	...	272°45
Markbeech Do.	...	...	...	...	274°35
Knockholt Beeches	...	...	...	...	282°35
Ide Hill Church	...	...	...	...	284°19
Hildenborough Do.	...	...	...	...	307°15
Langton Green Do.	...	...	...	...	310°13
Shipbourne Do.	...	...	...	...	311°12
Speldhurst Do.	...	...	...	...	311°54
Plaxtol Do.	...	...	...	...	312°19
Bidborough Do.	...	...	...	...	313°48
Platt Do.	...	...	...	...	314°2

Southborough Church	...	...	...	...	318 ⁰ ·28
„ St. Thomas Do.	...	...	...	...	319·48
Horley Down Do., Tunbridge Wells	...	...	...	...	321·24
West Peckham Do.	...	...	...	...	321·58
Rusthall Do.	...	...	...	...	323·10
Mereworth Do.	...	...	...	...	323·31
Hadlow Do.	...	...	...	...	323·34
East Peckham Do.	...	...	...	...	325·37
St. John's Do., Tunbridge Wells	...	...	...	...	326·48
Huntingdon's Do., Do.	...	...	...	...	328·0
Trinity Do., Do.	...	...	...	...	329·30
Eridge Do.	...	...	...	...	332·32
Broadwater Do., Tunbridge Wells	...	...	...	...	333·25
St. James's Do., Do.	...	...	...	...	333·42
Eridge Castle (Flag Staff)	...	...	...	...	336·12
Pembury Church	...	...	...	...	339·15
Linton Do.	...	...	...	...	341·57
„ Place	...	...	...	...	342·38
Leeds Church	...	...	...	...	345·22
Frant Do.	...	...	...	...	347·20
Sutton Vallance Do.	...	...	...	...	348·49
Ulcombe Do.	...	...	...	...	351·1
Saxonbury Lodge	...	...	...	...	351·30
Staplehurst Church	...	...	...	...	356·25
Edgerton Do.	...	...	...	...	357·41
Headcorn Do.	...	...	...	...	357·48

CHAPTER II.

CLIMATE—WHAT IS MEANT BY IT—OBSERVATIONS UPON THE TWO CONDITIONS OF INSTRUMENTAL EXPOSURE —VARIOUS METEOROLOGICAL TABLES.



O much difference is found to exist in the climatology of places situated not far distant from each other, that it may be as well to enquire what is meant by the term "Climate," as it affects the mental and physical condition of any community; and the following appear to be the more important influences, viz., the condition of atmosphere with respect to its pressure, temperature, humidity, and prevalent winds; its general freedom from noxious exhalations; its transparency as it affects radiation from the earth's surface; the amount of radiation itself being dependent, in a great measure, upon the nature of the soil; lastly, there is its electrical condition, which is doubtless a very important element, but extremely difficult of detection both as to its volume and specific character.

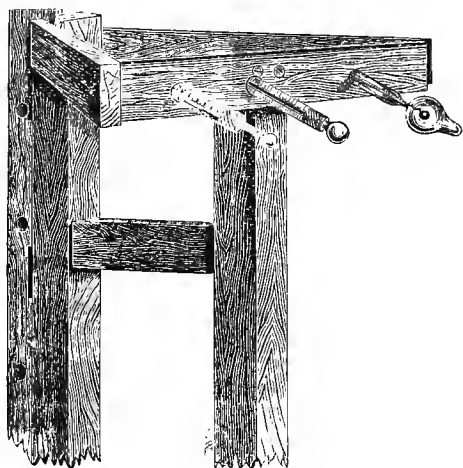
It will thus be seen what a field for enquiry lies open to those who seek to obtain all possible information with respect to the above-mentioned subjects; and how much care and patience are required for the several investigations.

In commencing a series of meteorological observations upon the summit of Crowborough Hill, the enquiry could not fail of being especially interesting, inasmuch as it would relate to the highest inhabited spot in this county, and also that no observations of a similar nature had ever been at-

tempted, in the South of England, at so great an elevation above the sea.

During the first year of my residence I commenced observations of a similar kind to those which I had conducted for so many years at Uckfield. In the following year a considerable discussion arose, among our most eminent English meteorologists, respecting the particular form of thermometer-stand which should be employed for the reception of self-registering thermometers, but without any very satisfactory result. It was, however, thought desirable, upon the whole, to adopt a form of stand known as "Stevenson's stand," which is, I believe, the form of stand at present recognised and adopted by the Meteorological Societies of England and Scotland.

The endless varieties of opinion expressed upon this subject induced me to commence a series of observations from self-registering instruments placed upon an open stand, without any protection whatever, of which the following is a representation :—



The thermometers are here exposed to every influence from radiation and wind. I attached additional interest to their indications, in the first place, because of their almost unique character, and secondly, because I had an impression that they would show, in a faithful manner, the temperature to which vegetation was actually exposed both by day and by night. In addition to the usual maximum and minimum thermometers, I also placed upon the stand another thermometer, having its bright bulb secured in vacuo, to register the heating power of the sun's rays, which does not render the instrument liable to record the inaccuracy which is engendered by one having its bulb blackened for the sole purpose of accumulating, in a very unfair manner, incident solar heat.

With the exception of some observations made in Scotland in the years 1861-62, and which are embodied in a paper by Alexander Buchan, Esq., "On the Meteorological Conditions which determine the profitable or unprofitable culture of farm crops in Scotland," published in the "Quarterly Report of the Scottish Meteorological Society," for June, 1862, I am not aware that any records of temperature, from exposed instruments, have been published. In the course of his paper, Mr. Buchan remarks, "The distinguishing peculiarity of the observations depends on the three-fold conditions under which the instruments were placed, viz., their bulbs not blackened, their height (four feet) from the ground, and their full exposure to sun and weather. Naked bulbs were preferred to blackened bulbs, inasmuch as observations made with unblackened bulbs furnish results more uniform, reliable, and comparable with each other, than could otherwise be the case." For information respecting local climatology, and its adaptation as a health resort, or for any particular agricultural requirements, I hold that observations as to temperature

should be conducted with fully exposed instruments in preference to those placed in a "Stevenson's stand," or any other device for protecting them against the influence of any source of radiation. The comparative tables of mean highest temperature in the open air and in the shade respectively, will show that the former gives a *mean* of $5^{\circ}6$, in the three summer months, above the latter, which constitutes a difference sufficient to decide whether, or no, certain cereal crops can be cultivated. There are several other points connected with the subsequent tables which I trust will be of some interest, and use, both to the meteorologist and agriculturist, as exhibiting the variations in temperature indicated by the two methods of instrumental position.

Both sets of instruments have been placed four feet above the ground, which, of course, renders their indications fairly comparable. It appears quite certain that, even then, fully exposed thermometers do not register so high a temperature as that to which vegetation is exposed, on account of the sun's rays being considerably deflected from the bulbs themselves; nevertheless they give a near approximation thereto, and, moreover, it is satisfactory to know that all kinds of crops are really subject to a higher temperature than the thermometers register. It should be duly considered that observations taken from instruments which are completely protected from the direct rays of the sun are not only absolutely useless, but positively misleading, when we know that during the important summer months they register perhaps a temperature of 10° lower than that to which plants have been exposed to, and influenced by, during their period of growth and maturation.

The table which gives the mean highest temperature in the sun's rays will probably be the most valuable to the agri-

culturist, and is altogether superior to the results shown by reference to the table of mean temperature, which, alone, will not inform us whether a certain crop will, or will not, grow to perfection in any given locality. The mean daily highest temperature, and the mean monthly temperature, as shewn by protected instruments, are wholly unable to indicate the actual summer temperature by which growing crops have been influenced. The true night temperature, to which most plants have been exposed, can only be ascertained by reference to the terrestrial radiation thermometer, placed upon the surface of short grass, and the exposed minimum thermometer placed four feet above it.

It is, however, possible, if not probable, that the terrestrial radiation instrument may show a lower temperature than that to which growing crops have been exposed when they have attained the height of a foot, or more—but a *very* approximately true condition of night temperature could be ascertained by adopting the results of the mean of these two thermometers; indeed, I cannot suggest any better method of obtaining the information sought for.

A competent knowledge of the average *night* temperature of any locality is of far more importance in respect of the healthy condition both of animal and vegetable life than is generally supposed; and will often explain the reason, more particularly, why the latter flourish more freely in some situations than others, whatever care may have been taken in each instance.

Before considering the following tables of temperature I will just remark that all the instruments were obtained from Negretti and Zambra of Holborn, and having been duly examined at Kew Observatory, I received a certificate of their excellence.

TABLE 1 gives the highest temperature in the open air in each month and year, as observed from a self-registering thermometer having a bright bulb and the graduation on the stem. The highest temperature recorded was $97^{\circ}4$ in July 1881.

TABLE 2 gives the highest temperature in the shade (Stevenson's stand) in each month and year. The thermometer is a counterpart of the preceding. The highest temperature recorded was $91^{\circ}5$, also in July, 1881.

TABLE 3 gives the lowest temperature in the open air at night, viz., 8° in January, 1881. The next lowest temperature was $15^{\circ}4$ in Dec., 1879.

TABLE 4 gives the lowest temperature in the stand at night, viz., 9° in January, 1881, which was only 1° higher than was shown by the preceding instrument upon the same occasion.

TABLE 5 gives the mean monthly and yearly highest temperature in the open air. The results show (1879 excepted) a remarkably equable range for the eleven years. The warmest year was 1884, and the coldest 1879.

TABLE 6 is a similarly constructed table for shade or protected temperature. In the course of eleven years the difference between the exposed and protected thermometers was only $3^{\circ}8$.

TABLE 7 shows the mean monthly and yearly lowest temperature at night in the open air. The nights of January are generally the coldest, but in this series the means for January and December are exactly alike. The average lowest night temperature for the whole year is $40^{\circ}5$. The coldest month was January, 1881.

TABLE 8 shows the mean monthly and yearly lowest temperature at night in the Stevenson's stand, but the average annual difference between the two conditions of exposure was only $1^{\circ}1$!

TABLE 9 gives the monthly and yearly mean temperature in the open air. Omitting the conspicuously cold year 1879, it will be seen how equable is the annual mean. The warmest month in the series was August, 1884.

TABLE 10 shows the monthly and yearly mean temperature in the shade ; and the average is $1^{\circ}3$ below that of the preceding table.

TABLE 11 shows the monthly and yearly mean daily range of temperature in the open-air. The yearly mean is $17^{\circ}2$. The three winter months are the least subject to great daily variations.

TABLE 12 shows the monthly and yearly mean daily range of temperature in the shade. We here notice a considerable difference from the preceding table amounting to $4^{\circ}8$! December is the month least subject to sudden changes of temperature. Mean daily range $12^{\circ}4$.

TABLE 13 shows the highest temperature of solar radiation (bright bulb in vacuo). The highest reading was $106^{\circ}6$ in August, 1884.

TABLE 14 shows the lowest temperature of terrestrial radiation from the surface of short grass in each month and year. The greatest cold occurred in January, 1881, when the low temperature of 2° was recorded.

TABLE 15 gives the mean monthly and yearly highest temperature of solar radiation—and I am not sure that any similar table has been published, with reference to the bright bulb thermometer in vacuo, for so long a period as nine years.

TABLE 16 gives the mean monthly and yearly lowest temperature of terrestrial radiation, on short grass, and shows the *very lowest* temperature to which vegetation has been exposed.

TABLE 17 shows the temperature of the four seasons of the year, under the two conditions of instrumental exposure, and the difference between them. As might be expected, the greatest difference occurs in summer and the least in winter, amounting in the former instance to rather more than two degrees, and in the latter to only a fraction of one degree!

TABLE 18 shows the mean monthly temperature of the Dew Point at 9 a.m. I thought it was desirable to insert this table, as from it are calculated the elastic force of vapour and relative humidity.

TABLE 19 shows the elastic force of vapour at 9 a.m., and its annual and monthly mean.

TABLE 20 gives relative humidity as calculated from the temperature of the dry bulb, the dew point, and the elastic force of vapour at 9 a.m.

TABLE 21 gives the yearly and monthly mean height of barometer at 9 a.m., corrected for Index error, capillarity, temperature to 32° , and altitude.

TABLE 1.

Highest Temperature in the Open Air in each Month and Year.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Absolute.
Jan. .	51.2	52.4	52.6	51.4	54.0	47.4	54.0	50.0	49.6	51.0	54.4	54.4
Feb. .	55.2	52.8	57.0	57.0	59.5	54.0	57.0	52.7	57.2	57.4	55.0	59.4
March	69.0	57.6	58.0	61.4	60.0	65.0	65.0	64.5	67.7	58.6	65.8	69.0
April.	73.6	74.0	66.0	62.0	66.5	64.2	70.5	66.5	68.4	73.6	66.7	74.0
May .	77.4	78.6	72.0	68.8	74.0	73.5	81.2	77.2	78.8	77.2	84.4	84.4
June .	81.0	83.0	84.0	84.7	90.5	76.5	81.0	81.5	78.8	83.6	85.3	90.5
July .	89.4	78.4	92.4	84.2	87.2	82.6	83.2	97.4	80.0	80.6	87.7	97.4
Aug. .	82.8	82.2	92.0	80.4	79.7	82.8	82.0	82.5	83.4	84.2	95.2	95.2
Sept..	76.2	80.0	72.2	69.4	79.0	76.2	84.0	76.0	73.8	77.0	83.6	83.6
Oct.	67.6	65.2	72.0	65.5	72.1	68.0	71.5	64.0	69.9	70.2	68.8	72.1
Nov.	63.2	58.2	63.0	61.1	50.3	57.4	55.1	60.6	59.4	56.7	61.2	63.2
Dec.	50.2	50.0	53.0	50.0	50.2	50.0	56.5	58.0	52.4	52.8	52.4	58.0
Absolute	89.4	83.0	92.4	84.7	90.5	82.8	84.0	97.4	83.4	84.2	95.2	97.4

TABLE 2.

Highest Temperature in the Shade in each Month and Year.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Absolute.
Jan.	50.2	49.7	50.4	51.3	49.6	47.4	53.0	48.1	48.8	50.2	50.8	53.0
Feb.	52.6	47.1	53.0	54.4	51.1	50.0	54.3	50.0	53.8	52.0	51.0	54.4
March	63.4	54.0	55.8	63.0	56.0	62.0	60.7	60.8	64.0	52.6	62.0	64.0
April.	71.8	76.8	64.6	61.4	60.2	56.1	61.4	62.6	62.0	68.2	61.6	76.8
May.	73.4	74.2	66.0	61.2	67.0	66.8	76.1	72.7	71.1	72.6	78.6	78.6
June.	75.6	77.5	78.7	77.4	82.3	68.0	73.6	75.9	71.4	78.2	78.5	82.3
July.	86.8	72.4	85.0	79.0	80.5	77.0	77.0	91.5	74.4	76.0	80.2	91.5
Aug.	78.4	77.6	87.5	75.0	72.3	75.3	76.2	76.0	77.8	79.1	88.9	88.9
Sept.	73.4	75.7	66.8	63.6	73.8	68.0	80.0	72.0	68.4	72.4	79.0	80.0
Oct.	63.2	62.6	67.7	62.0	66.8	64.0	66.8	58.4	66.0	65.0	63.3	67.7
Nov.	61.0	55.1	59.4	56.5	49.6	52.2	52.5	58.0	56.6	52.3	57.8	61.0
Dec.	50.0	50.1	51.6	50.0	49.7	48.4	53.6	50.0	51.2	51.2	51.2	53.6
Absolute	86.8	77.6	87.5	79.0	82.3	77.0	80.0	91.5	77.8	79.1	88.9	91.5

TABLE 3.

Lowest Temperature in the Open Air in each Month and Year.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Absolute.
Jan.	27.8	19.6	14.7	27.2	25.0	17.5	17.2	8.0	21.0	26.2	27.5	8.0
Feb.	22.0	20.2	20.4	21.8	26.5	20.0	28.0	24.1	25.1	30.0	25.7	20.0
March	16.2	24.0	22.2	21.6	20.3	26.4	28.5	21.2	24.2	19.0	26.5	16.2
April.	32.2	29.2	26.8	29.7	23.3	21.8	31.2	24.0	29.8	28.8	27.0	21.8
May	31.2	36.2	29.8	27.1	34.0	26.7	32.0	29.0	33.3	28.1	33.0	26.7
June	37.0	43.0	38.4	40.0	42.0	39.0	33.3	33.7	38.4	37.0	40.1	33.3
July	47.2	43.2	44.6	40.8	43.4	43.0	44.2	43.0	45.0	41.0	41.0	40.8
Aug.	43.8	44.0	40.0	42.2	46.1	44.7	45.0	40.7	43.1	45.0	42.1	40.0
Sept.	41.0	44.2	39.2	34.6	39.0	35.3	38.0	42.8	37.2	40.0	41.6	34.6
Oct.	33.0	32.6	30.3	30.0	28.0	28.8	26.6	27.1	33.0	33.0	31.0	26.6
Nov.	25.2	25.8	25.2	30.0	26.4	21.0	23.8	29.0	26.1	28.0	24.4	21.0
Dec.	18.2	19.0	26.2	26.2	18.5	15.4	24.5	27.0	21.2	23.4	27.0	15.4
Absolute	16.2	19.0	14.7	21.6	18.5	15.4	17.2	8.0	21.0	19.0	24.4	8.0

TABLE 4.

Lowest Temperature in the Shade in each Month and Year.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Absolute.
Jan. .	27.8	22.3	16.8	29.4	26.6	18.8	19.6	9.0	24.4	27.7	28.0	9.0
Feb. .	22.0	22.1	23.6	23.3	27.5	22.2	30.0	26.2	26.8	32.0	27.5	22.0
March	18.2	26.6	23.0	23.8	22.7	27.3	30.2	22.6	26.4	21.1	29.0	18.2
April.	33.0	31.6	28.6	32.0	25.1	24.5	32.6	25.6	31.6	30.0	29.0	24.5
May .	31.0	38.2	31.0	29.3	36.0	28.4	33.3	32.0	35.0	30.1	35.4	28.4
June .	37.2	44.4	39.3	41.0	43.0	40.4	35.5	35.5	39.8	38.6	42.0	35.5
July .	47.6	45.3	48.6	42.8	46.3	45.0	45.6	45.0	46.5	43.5	43.3	42.8
Aug. .	43.2	45.6	42.6	45.0	47.8	45.0	47.6	43.4	44.5	46.4	44.0	42.6
Sept. .	40.4	45.4	41.0	36.7	40.6	37.0	40.2	45.2	40.0	42.2	37.0	36.7
Oct. .	34.0	37.0	32.1	32.8	30.0	30.6	27.6	27.5	34.5	35.0	32.7	27.5
Nov. .	25.2	26.0	28.6	32.0	28.4	22.4	25.7	30.2	28.6	30.0	25.8	22.4
Dec. .	17.6	20.4	29.4	28.0	19.3	17.6	26.3	28.8	24.6	25.7	28.8	17.6
Absolute	17.6	20.4	16.8	23.3	19.3	17.6	19.6	9.0	24.4	21.1	25.8	9.0

TABLE 5.

The Mean Monthly and Yearly Highest Temperature in the Open Air.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
Jan. . .	46.3	46.1	40.0	46.8	43.9	34.7	38.5	36.1	43.4	44.2	46.6	42.2
Feb. . .	45.1	39.2	45.0	48.9	46.5	42.7	48.9	42.2	48.0	48.5	47.6	45.7
March	51.4	46.3	48.1	48.6	50.1	49.4	56.3	52.7	56.3	45.9	54.0	50.8
April.	59.7	56.6	56.0	54.4	58.5	54.2	58.2	55.8	59.4	59.8	56.5	57.2
May . .	62.3	65.4	60.2	59.2	65.5	60.8	67.5	66.2	67.2	65.3	67.0	64.2
June . .	69.7	68.2	69.6	73.6	72.8	67.8	69.1	71.1	69.1	71.2	70.5	70.2
July . .	77.4	67.8	78.0	72.1	76.3	68.9	74.6	79.5	72.2	72.7	77.5	74.2
Aug. . .	70.1	73.1	75.8	72.0	73.6	70.8	75.2	71.0	72.1	75.2	81.8	73.7
Sept. . .	66.8	69.6	65.8	63.2	69.0	66.6	70.7	66.3	66.1	68.7	70.5	67.5
Oct. . .	58.8	54.8	58.7	58.0	60.0	58.7	55.5	53.7	58.8	58.7	58.1	57.6
Nov. . .	48.4	46.5	49.2	51.9	44.1	44.0	48.5	52.7	48.8	49.9	46.6	48.2
Dec. . .	36.7	40.7	46.6	44.7	37.6	38.1	47.4	43.3	44.3	42.9	43.1	42.3
Mean. .	57.7	56.2	57.8	57.8	58.2	54.7	59.2	57.5	58.8	58.5	59.9	57.8

TABLE 6.

The Mean Monthly and Yearly Highest Temperature in the Shade.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
Jan. .	44.8	44.8	39.4	46.4	41.9	34.2	36.8	34.3	42.4	43.1	45.4	41.2
Feb. .	43.2	37.0	42.9	46.5	44.2	40.6	46.6	40.5	45.2	45.9	45.3	43.4
March	48.6	43.2	45.2	45.1	45.8	46.0	51.7	49.0	52.5	42.0	49.4	47.1
April.	57.4	52.8	52.0	50.6	54.0	48.9	52.7	51.1	54.5	53.9	50.4	52.5
May .	58.7	60.6	54.8	53.9	60.0	54.2	60.1	60.6	61.0	60.3	61.8	58.7
June .	66.3	63.5	64.2	68.2	66.6	61.8	63.6	64.2	63.1	66.4	65.5	64.8
July .	74.5	63.9	72.2	66.4	69.5	63.1	66.8	73.2	66.1	67.1	70.8	68.5
Aug. .	67.0	67.7	71.0	66.7	67.5	65.2	69.5	65.2	66.1	69.9	75.3	68.2
Sept. .	64.2	65.3	61.8	58.5	63.9	61.7	66.2	61.5	61.2	63.3	65.6	63.0
Oct. .	56.5	52.0	56.3	54.5	56.1	55.3	52.7	49.7	55.3	55.2	54.4	54.3
Nov. .	46.9	45.4	47.5	49.8	42.0	40.9	46.3	51.6	46.8	47.9	44.9	46.3
Dec. .	35.4	39.4	45.2	43.4	36.0	36.9	45.9	42.1	43.0	42.0	42.2	41.0
Mean . .	55.3	53.0	54.4	54.2	54.0	50.7	54.9	53.6	54.7	54.7	55.9	54.0

TABLE 7.

The Mean Monthly and Yearly Lowest Temperature in the Open Air.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
Jan. .	35.3	37.4	30.5	36.0	33.6	26.5	27.6	24.7	33.0	34.5	36.1	32.3
Feb. .	33.3	29.6	33.9	36.1	35.9	31.3	34.7	31.6	35.0	34.7	35.3	33.7
March	35.1	32.8	32.7	32.0	33.7	32.8	36.3	34.1	36.7	27.7	35.2	33.5
April.	40.5	37.2	38.6	36.4	38.4	35.2	37.4	36.1	38.1	36.4	35.5	37.2
May	39.8	44.2	38.4	39.0	45.3	37.5	40.6	42.1	42.3	41.3	43.2	41.2
June .	47.1	47.6	47.5	49.5	49.0	47.2	46.3	46.8	46.2	47.0	46.5	47.3
July .	52.6	50.4	52.2	49.4	52.3	48.6	51.0	52.0	49.5	49.4	51.6	50.8
Aug..	50.3	53.0	50.6	52.2	52.6	51.4	53.4	49.5	49.2	51.3	53.2	51.5
Sept..	49.9	51.6	47.4	44.7	47.0	47.2	50.6	48.0	45.9	48.5	52.7	48.5
Oct..	44.8	42.4	46.3	40.6	43.8	43.2	39.7	37.5	43.5	42.8	40.8	42.3
Nov..	36.7	36.7	37.3	37.7	32.6	32.6	34.8	41.3	36.2	35.8	35.4	36.1
Dec..	27.4	32.5	38.5	33.4	27.4	25.9	36.1	33.5	33.9	33.3	34.1	32.3
Mean .	41.1	41.3	41.2	40.5	41.0	38.3	40.7	39.8	40.8	40.2	41.6	40.5

TABLE 8.

The Mean Monthly and Yearly Lowest Temperature in the Shade.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
Jan. .	35.4	37.5	31.3	37.4	34.9	27.3	28.8	26.2	34.2	35.3	37.0	33.2
Feb. .	33.3	30.0	34.9	37.2	36.6	32.0	35.4	32.7	35.9	35.6	36.3	34.5
March	35.2	33.6	33.4	33.5	34.6	33.8	37.3	35.2	38.1	29.1	36.6	34.6
April.	40.6	38.4	39.7	38.5	39.4	35.9	38.5	37.2	39.3	37.9	36.7	38.3
May .	39.7	45.3	39.6	40.3	46.2	38.8	42.0	43.2	43.8	42.7	44.0	42.3
June .	47.2	48.7	48.4	50.6	50.4	48.0	47.7	48.3	47.4	47.4	47.8	48.3
July .	53.1	51.5	54.4	51.0	53.7	49.5	52.2	53.9	50.5	50.2	53.1	52.1
Aug. .	50.2	54.0	54.4	53.3	53.8	52.3	54.5	50.6	50.7	53.2	55.1	52.8
Sept. .	49.6	52.5	48.9	46.2	48.6	48.3	51.9	49.0	47.2	49.1	51.9	49.3
Oct. .	44.7	42.4	47.4	42.1	45.1	44.0	40.5	38.7	44.5	44.0	42.3	43.2
Nov. .	36.4	37.3	38.3	40.0	33.7	32.5	36.1	42.3	37.3	36.8	36.7	37.0
Dec. .	27.0	33.4	39.4	34.8	28.4	27.5	37.1	34.7	35.0	34.3	35.0	33.3
Mean . .	41.0	42.0	42.4	42.1	42.1	39.2	41.8	41.0	41.9	41.3	42.7	41.6

TABLE 9.

The Monthly and Yearly Mean Temperature in the Open Air.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
Jan. .	40.8	41.8	35.5	41.4	38.7	30.6	33.0	30.4	38.2	39.3	41.3	37.3
Feb. .	39.2	34.4	39.4	42.5	41.2	37.0	41.8	36.9	41.5	41.6	41.4	39.7
March	43.0	39.5	40.4	40.3	41.9	41.1	46.3	43.4	46.5	36.8	44.6	42.1
April.	50.1	46.9	47.3	45.4	48.4	44.7	47.8	45.9	48.7	48.1	46.0	47.2
May .	51.0	54.8	49.3	49.1	55.4	49.1	54.0	54.1	54.7	53.3	55.1	52.7
June .	58.4	57.9	58.5	61.5	60.9	57.5	57.7	58.9	57.6	59.1	58.5	58.7
July .	65.0	59.1	65.1	60.7	64.3	58.7	62.8	65.7	60.8	61.0	64.5	62.5
Aug. .	60.2	63.1	63.2	62.1	63.1	61.1	64.3	60.2	60.6	63.2	67.5	62.6
Sept. .	58.3	60.6	56.6	53.9	58.0	56.9	60.6	57.1	56.0	58.6	61.6	58.0
Oct. .	51.8	48.6	52.5	49.3	51.9	50.9	47.6	45.6	51.1	50.7	49.4	49.9
Nov. .	42.5	41.6	43.2	44.8	38.3	38.2	41.6	47.0	42.5	42.8	41.0	42.1
Dec. .	32.0	36.6	42.5	39.0	32.5	32.0	41.7	38.4	39.1	38.1	38.6	37.3
Mean . .	49.3	48.7	49.4	49.1	49.5	46.4	49.9	48.6	49.8	49.3	50.8	49.1

TABLE 10.
The Monthly and Yearly Mean Temperature in the Shade.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
Jan. .	40.1	41.1	35.3	41.9	38.4	30.7	32.8	30.2	38.3	39.2	41.2	37.2
Feb. .	38.3	33.5	38.9	41.8	40.4	36.3	41.0	36.6	40.5	40.7	40.8	38.9
March	41.9	38.4	39.3	39.3	40.2	39.9	44.5	42.1	45.3	35.5	43.0	40.8
April.	49.0	45.6	45.8	44.5	46.4	42.4	45.6	44.1	46.9	45.9	43.5	45.4
May .	49.2	52.9	47.2	47.1	53.1	46.5	51.0	51.9	52.4	51.5	52.9	50.5
June .	56.8	56.1	56.3	59.4	58.5	54.9	55.6	56.2	55.2	56.9	56.6	56.6
July .	63.8	57.7	63.3	58.7	61.6	56.3	59.5	63.5	58.3	58.6	61.9	60.3
Aug. .	58.6	60.8	62.2	60.0	60.6	58.7	62.0	57.9	58.4	61.5	65.2	60.5
Sept. .	56.9	58.9	55.3	52.3	56.2	55.0	59.0	55.2	54.2	56.2	58.7	56.2
Oct. .	50.6	47.2	51.8	48.3	50.6	49.6	46.6	44.2	49.9	49.6	48.3	48.8
Nov. .	41.7	41.3	43.9	44.9	37.8	36.7	41.2	46.9	42.0	42.3	40.8	41.7
Dec. .	31.2	36.4	42.3	39.1	32.2	32.2	41.5	38.4	39.1	38.1	38.6	37.2
Mean .	48.1	47.5	48.4	48.1	48.0	44.9	48.3	47.2	48.3	48.0	49.3	47.8

TABLE 11.

The Monthly and Yearly Mean Daily Range of Temperature in the Open Air.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
Jan. .	11.0	8.7	10.0	10.8	10.3	8.2	10.9	11.4	10.4	9.7	10.5	10.1
Feb. .	11.8	9.7	11.1	12.8	10.6	11.4	14.2	10.6	13.0	13.8	12.3	11.9
March	15.9	13.5	15.4	16.6	16.4	16.6	20.0	18.6	19.6	18.2	18.8	17.2
April.	19.2	19.4	17.4	18.0	20.1	19.0	20.8	19.7	21.3	23.4	21.0	19.9
May .	22.5	21.2	21.8	20.2	20.2	23.3	26.9	24.1	24.9	24.0	23.8	22.9
June .	22.6	20.6	22.1	24.1	23.8	20.6	22.8	24.3	22.9	24.2	24.0	22.9
July .	24.8	17.5	25.8	22.7	24.0	20.3	23.6	27.5	22.7	23.3	25.9	23.4
Aug. .	19.8	20.1	25.2	19.8	21.0	19.4	21.8	21.5	22.9	23.9	28.6	22.1
Sept. .	16.9	18.0	18.4	18.5	22.0	19.4	20.1	18.3	20.2	20.2	17.8	19.0
Oct. .	14.0	12.4	12.4	17.4	16.2	15.5	15.8	16.2	15.3	15.9	17.3	15.3
Nov. .	11.7	9.8	11.9	14.2	11.5	11.4	13.7	11.4	12.6	14.1	11.2	12.1
Dec. .	9.3	8.2	8.1	11.3	10.2	12.2	11.3	9.8	10.4	9.6	9.0	9.9
Mean .	16.6	15.0	16.6	17.2	17.2	16.4	18.5	17.8	18.0	18.3	18.3	17.2

TABLE 12.

The Monthly and Yearly Mean Daily Range of Temperature in the Shade.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
Jan. .	9.4	7.3	8.1	9.0	7.0	6.9	8.0	8.1	8.2	7.8	8.4	8.0
Feb. .	9.9	7.0	8.0	9.3	7.6	8.6	11.2	7.8	9.3	10.3	9.0	8.9
March	13.4	9.6	11.8	11.6	11.2	12.2	14.4	13.8	14.4	12.9	12.8	12.5
April.	16.8	14.4	12.3	12.1	14.6	13.0	14.2	13.9	15.2	16.0	13.7	14.2
May .	19.0	15.3	15.2	13.6	13.8	15.4	18.1	17.4	17.2	17.6	17.8	16.4
June .	19.1	14.8	15.8	17.6	16.2	13.8	15.9	15.9	15.7	19.0	17.7	16.5
July .	21.4	12.4	17.8	15.4	15.8	13.6	14.6	19.3	15.6	16.9	17.7	16.4
Aug. .	16.8	13.7	17.6	13.4	13.7	12.9	15.0	14.6	15.4	16.7	20.2	15.4
Sept. .	14.6	12.8	12.9	12.3	15.3	13.4	14.3	12.5	14.0	14.2	13.7	13.6
Oct. .	11.7	9.6	8.9	12.4	11.0	11.3	12.2	11.0	10.8	11.2	12.1	11.1
Nov. .	10.5	8.1	9.2	9.8	8.3	8.4	10.2	9.3	9.5	11.1	8.2	9.3
Dec. .	8.4	6.0	5.8	8.6	7.6	9.4	8.8	7.4	8.0	7.7	7.2	7.7
Mean . .	14.2	10.8	11.9	12.1	11.8	11.6	13.0	12.5	12.8	13.4	13.2	12.4

TABLE 13.

Highest Temperature of Solar Radiation in Vacuo in each Month and Year (Bright Bulb).

	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Extreme.
January	63.0	61.4	63.7	51.0	61.6	61.4	55.6	58.2	61.6	63.7
February	64.6	70.0	71.0	64.0	65.0	60.0	66.0	66.0	67.0	71.0
March	70.2	74.0	71.0	72.6	75.4	71.6	76.4	70.0	77.0	77.0
April	78.4	75.0	77.0	77.1	80.5	76.0	81.4	86.0	77.0	86.0
May	84.2	80.4	85.4	85.0	90.4	87.1	92.0	92.6	94.5	94.5
June	97.6	97.2	98.4	87.0	92.9	92.0	93.5	97.0	97.7	98.4
July	104.0	95.7	97.8	94.1	92.0	106.2	94.5	94.0	98.8	106.2
August	103.0	94.0	89.0	93.0	90.0	90.6	97.2	94.1	106.6	106.6
September	84.6	82.0	88.5	87.1	93.0	86.8	88.0	88.5	92.0	93.0
October	81.7	75.3	81.0	77.8	82.0	76.0	83.6	82.5	77.4	83.6
November	72.0	70.2	59.0	65.3	63.0	70.0	69.2	67.0	67.7	72.0
December	61.0	57.8	56.0	55.4	60.0	56.2	56.0	56.5	56.0	61.0
Absolute	104.0	97.2	98.4	94.1	93.0	106.2	97.2	97.0	106.6	106.6

TABLE 14.

Lowest Temperature of Terrestrial Radiation upon the Surface of Short Grass in each Month and Year.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Extreme.
Jan. .	25.0	15.4	9.6	20.1	21.2	9.0	14.2	2.0	14.5	17.2	28.2	2.0
Feb. .	19.2	25.6	8.2	16.4	19.0	17.6	21.9	14.0	20.0	21.1	23.8	8.2
March	16.2	28.6	17.4	16.0	17.4	17.8	21.0	13.0	19.8	12.8	23.1	12.8
April.	27.6	29.4	25.1	32.0	20.2	18.5	27.5	20.8	26.2	23.0	26.0	18.5
May .	29.4	36.0	25.0	24.3	31.2	22.4	28.0	20.4	30.5	24.8	28.8	20.4
June .	34.0	40.0	33.4	38.1	37.0	35.0	30.4	31.2	31.7	30.8	37.8	30.4
July .	43.0	36.2	39.4	42.8	36.1	39.0	37.0	36.5	39.6	39.3	38.8	36.1
Aug..	42.0	39.0	34.0	45.0	41.0	41.0	38.6	34.7	36.6	41.5	39.2	34.0
Sept..	39.2	41.0	36.2	31.3	32.0	33.8	32.0	33.2	28.5	37.1	37.0	28.5
Oct. .	32.2	25.2	26.2	23.0	26.5	23.8	19.0	18.8	23.4	29.2	28.8	18.8
Nov..	29.0	23.1	15.2	24.4	19.2	11.0	11.8	22.2	16.7	25.2	21.8	11.0
Dec..	18.4	16.8	16.8	21.8	9.8	6.5	12.0	16.0	13.1	21.8	23.6	6.5
Absolute	16.2	15.4	8.2	16.0	9.8	6.5	11.8	2.0	13.1	12.8	21.8	2.0

TABLE 15.

The Mean Monthly and Yearly Highest Temperature of Solar Radiation in Vacuo (Bright Bulb).

	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
January	45.8	51.2	48.6	39.6	42.8	41.8	45.9	49.1	50.2	46.1
February	52.0	57.0	50.7	48.6	55.1	47.2	53.1	55.1	55.2	52.6
March	58.2	58.6	58.9	57.0	66.6	60.2	66.6	58.4	63.2	60.8
April	67.8	66.0	69.4	66.0	67.4	64.6	72.3	71.6	67.3	68.0
May	72.4	68.5	76.2	72.3	76.3	75.6	81.0	79.1	78.7	75.5
June	81.9	85.4	82.8	78.2	78.4	80.6	82.2	86.1	83.0	82.0
July	90.0	84.5	85.9	78.4	83.6	88.0	84.9	86.4	88.3	85.5
August	87.8	83.8	83.4	80.2	83.7	80.9	84.4	85.5	91.4	84.5
September	77.0	73.1	77.6	75.2	79.4	75.4	77.4	80.2	79.4	77.2
October	66.1	66.3	61.4	63.2	60.7	61.7	67.5	66.7	66.0	64.4
November	56.4	57.5	48.4	50.3	53.2	57.0	55.8	56.4	51.1	54.1
December	48.3	49.8	42.0	42.1	49.7	46.6	48.2	46.8	46.2	46.6
Mean	67.0	66.8	65.4	62.6	66.4	65.0	68.2	68.4	68.3	66.4

TABLE 16.

The Mean Monthly and Yearly Lowest Temperature of Radiation upon Short Grass.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
Jan. .	33.5	36.3	26.9	32.0	30.5	23.0	25.3	20.0	29.5	33.0	34.8	29.5
Feb. .	31.8	30.2	30.6	33.5	33.2	29.1	31.1	27.9	30.3	32.6	34.3	31.3
March	33.6	32.8	30.7	28.6	30.6	28.6	33.0	29.4	32.2	25.0	33.6	30.7
April .	38.8	36.4	35.9	34.9	34.4	31.9	34.2	32.7	33.6	32.6	34.3	34.5
May .	37.9	44.0	35.6	36.6	42.8	33.3	36.4	36.3	37.5	38.0	40.1	38.0
June .	45.3	47.3	44.5	47.5	45.8	44.2	44.0	41.7	42.7	44.3	44.8	44.7
July .	50.9	50.3	49.8	48.3	48.5	46.5	48.3	48.1	45.8	46.3	49.9	48.4
Aug. .	48.3	55.8	48.3	50.1	49.1	50.2	50.3	45.9	44.1	48.2	50.5	49.1
Sept. .	48.2	50.6	44.1	40.4	42.8	44.1	44.5	43.9	40.2	46.1	48.0	44.5
Oct. .	43.7	42.0	42.7	36.2	40.4	39.5	34.6	34.1	37.9	40.7	37.4	39.0
Nov. .	36.0	36.4	34.1	34.3	30.6	28.1	28.8	37.0	31.6	33.4	32.9	33.0
Dec. .	27.4	32.5	35.2	29.5	24.6	21.8	30.2	29.8	31.7	32.2	32.9	29.8
Mean. .	39.6	41.2	38.2	37.7	37.8	35.0	36.7	35.5	36.4	37.7	39.4	37.7

TABLE 17.

Mean Temperature of the Seasons.

	IN THE OPEN AIR.				IN THE SHADE.			
	Winter.	Spring.	Summer.	Autumn.	Winter.	Spring.	Summer.	Autumn.
1874	40.2	48.0	61.2	50.8	39.6	46.7	59.7	49.7
1875	36.0	47.0	60.0	50.2	35.2	45.6	58.2	49.1
1876	37.1	45.6	62.2	50.7	36.8	44.1	60.6	50.3
1877	42.1	44.9	61.4	49.3	42.0	43.6	59.3	48.5
1878	39.6	48.5	62.7	49.4	39.3	46.5	60.2	48.2
1879	33.3	44.9	59.1	48.6	33.0	42.9	56.6	47.1
1880	35.6	49.3	61.6	49.9	35.3	47.0	59.0	48.9
1881	36.3	47.8	61.6	49.9	36.1	46.0	59.2	48.7
1882	39.3	49.9	59.6	49.9	39.0	48.2	57.3	49.0
1883	40.0	46.0	61.1	50.7	39.6	44.3	59.0	49.3
1884	40.2	48.5	63.5	50.6	40.0	46.4	61.2	49.3
Mean.	38.1	47.3	61.2	50.0	37.8	45.5	59.1	48.9

The Difference between the Mean Temperature of the Seasons, under these two conditions respectively, was as follows :—

	Winter.	Spring.	Summer.	Autumn.
In the Open Air	38.1	47.3	61.2	50.0
In the Shade	37.8	45.5	59.1	48.9
Excess of Temperature in the Open Air }	0.3	1.8	2.1	1.1

TABLE 18.
Monthly Mean Temperature of Dew Point at 9 a.m.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
Jan. .	37.9	40.1	33.6	40.2	35.7	28.8	30.9	26.7	37.0	37.7	39.3	35.2
Feb. .	35.0	31.3	36.6	39.4	37.9	34.9	38.6	34.5	37.6	38.7	38.1	36.6
March	37.8	34.1	36.2	35.7	34.2	36.3	38.7	36.7	40.3	30.9	37.9	36.2
April.	41.8	38.8	41.4	39.5	42.6	38.0	40.2	37.9	42.2	39.1	38.3	39.9
May .	41.6	46.9	40.9	41.2	49.2	41.2	43.5	45.1	46.9	46.2	46.6	44.4
June .	47.7	51.5	50.4	51.9	51.7	51.3	51.6	49.2	50.4	51.8	50.1	50.6
July .	55.6	52.8	55.8	52.9	55.6	52.6	54.8	55.2	53.8	53.1	56.1	54.4
Aug. .	52.4	55.1	53.7	54.1	56.1	54.9	56.9	52.8	52.7	55.9	56.2	54.6
Sept. .	53.3	54.5	51.5	48.7	51.8	52.3	54.7	51.9	50.2	52.9	54.2	52.3
Oct. .	46.9	45.3	48.9	43.2	46.8	47.3	42.5	40.5	48.0	46.9	46.7	45.7
Nov. .	37.7	38.5	39.9	42.6	35.1	30.0	38.7	45.6	38.7	41.7	38.3	38.8
Dec. .	30.3	34.9	41.2	36.8	30.4	29.6	40.1	36.3	38.0	36.0	36.7	35.5
Mean . .	43.2	43.6	44.2	43.8	43.9	41.4	44.3	42.7	44.6	44.2	44.8	43.7

TABLE 19.

Mean Monthly Elastic Force of Vapour at 9 a.m.

	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1874.	.228	.204	.227	.265	.263	.331	.443	.394	.407	.322	.226	.169	.290
1875.	.248	.176	.196	.236	.322	.381	.400	.434	.425	.303	.233	.203	.296
1876.	.193	.217	.214	.261	.256	.366	.446	.413	.381	.346	.246	.259	.299
1877.	.249	.241	.209	.242	.259	.386	.401	.419	.344	.279	.273	.218	.293
1878.	.209	.228	.197	.273	.351	.384	.443	.451	.385	.321	.204	.170	.301
1879.	.158	.203	.214	.229	.259	.378	.397	.431	.393	.327	.167	.164	.276
1880.	.173	.234	.235	.249	.283	.382	.430	.464	.428	.272	.235	.248	.303
1881.	.145	.199	.218	.228	.301	.351	.436	.400	.386	.252	.306	.214	.286
1882.	.220	.225	.250	.269	.322	.366	.415	.399	.364	.335	.235	.229	.286
1883.	.226	.235	.173	.238	.313	.385	.404	.447	.401	.322	.264	.218	.302
1884.	.240	.230	.228	.231	.318	.362	.451	.453	.421	.319	.231	.218	.308
Mean . .	.208	.217	.214	.247	.295	.370	.424	.427	.394	.309	.238	.210	.295

TABLE 20.

Relative Humidity calculated from the Temperature of the Air and the Dew Point at 9 a.m.
0—100.

	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1874.	93	91	85	71	69	66	66	73	81	83	83	94	79
1875.	94	93	84	73	73	77	79	78	82	88	90	92	83
1876.	92	92	85	79	71	74	71	67	84	86	89	94	82
1877.	92	89	85	79	71	67	73	77	82	78	88	89	80
1878.	88	91	77	81	82	70	74	80	78	85	87	91	82
1879.	90	93	88	80	75	82	82	82	85	89	74	90	84
1880.	95	91	77	77	71	79	80	83	82	86	89	92	83
1881.	89	89	80	75	69	71	68	79	86	84	92	90	81
1882.	94	90	79	80	74	79	82	80	83	89	87	95	84
1883.	93	91	84	75	74	75	76	78	88	89	95	91	84
1884.	91	89	80	75	73	73	74	65	84	90	90	91	81
Mean . .	92	91	82	77	73	74	73	76	83	86	87	91	82

TABLE 21.

The Yearly and Monthly Mean Height of the Barometer at 9 a.m., Corrected for Index Error, Capillarity, Temperature, and Altitude.

	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	Mean.
Jan.	30.116	29.987	30.300	29.899	30.187	29.993	30.400	29.906	30.385	29.947	30.152	30.114
Feb.	30.057	30.067	29.843	29.948	30.311	29.563	29.842	29.845	30.275	30.095	29.946	29.981
March	30.205	30.159	29.591	29.778	30.090	30.003	30.109	29.925	30.036	29.934	29.954	29.980
April.	29.928	30.071	29.873	29.772	29.842	29.693	29.891	29.942	29.794	30.017	29.808	29.875
May.	29.984	30.042	30.124	29.865	29.802	30.010	30.097	30.106	30.049	29.962	30.014	30.005
June.	30.124	29.945	29.997	30.027	29.955	29.828	29.917	29.987	29.927	29.931	30.033	29.970
July.	30.025	29.969	30.094	29.939	30.034	29.820	29.918	30.014	29.896	29.855	29.968	29.957
Aug.	29.998	30.060	29.956	29.893	29.765	29.857	29.993	29.870	29.933	30.038	30.019	29.943
Sept.	29.973	30.061	29.808	30.070	30.008	29.995	29.997	29.985	29.861	29.837	30.023	29.965
Oct.	29.914	29.803	29.940	30.053	29.798	30.140	29.898	30.011	29.824	29.985	30.090	29.950
Nov.	29.987	29.782	29.896	29.741	29.752	30.235	29.993	29.987	29.733	29.864	30.183	29.923
Dec.	29.803	30.145	29.521	30.058	29.753	30.342	29.956	30.061	29.694	30.197	29.888	29.947
Mean . .	30.014	30.007	29.912	29.920	29.941	29.956	30.000	29.979	29.950	29.971	30.006	29.968



RECEDING tables, which give results of the two methods of instrumental exposure, would lead us, I think, to infer that it would be desirable to organize the two series of observations for the investigation of local climatology, more particularly in the case of known health resorts, where I apprehend

there would not be any great difficulty in obtaining competent observers. I feel assured that in some instances very unexpected and important results would be obtained for the benefit of invalids generally; and with respect to climatological investigations, as affecting the agriculturist, I cannot suppose any observations would be complete, or even satisfactory, without the records of temperature from fully exposed instruments. It would naturally be expected that the exposed minimum thermometer would give, for the most part, a *much* lower reading than the protected one, in consequence of the early condensation of moisture upon the bulb and its subsequent evaporation from the surface, but I do not find such to be the case generally. The almost constant movement of air upon the Hill prevents this deposition of moisture upon the exposed bulb, and the readings therefore differ very slightly from the protected instrument, while occasionally it reads the higher of the two.

Another point worthy of notice is, that the time of greatest cold during the night does not correspond with that in the valley. I have found upon many occasions that the lowest temperature occurs very generally between the hours of nine and ten in the evening, and subsequently shows a tendency to rise without falling again during the night. It is quite

possible that this feature obtains generally upon high ground, but the fact is new to me, and wholly differs from my previous experience on the much lower ground at Uckfield. Hence it follows that it is a somewhat exceptional occurrence to have tender plants injured by frost on Crowborough Hill at any time between the months of March and October.

Referring again to the tables, we find, during the whole series, that great equability of temperature is a marked feature in the annual results, whether we consider the readings from the exposed or protected instruments. The remarkably low temperature of 1879, so conspicuous throughout the whole year, affects to a certain extent the average of the eleven years. If we omit this year, the average annual temperature will be found to vary less than two degrees. It may be as well to state that the monthly mean temperature has been obtained from the summary of the daily maxima and minima, separately considered, and not from the total of the diurnal mean. I think this method gives the best estimate of the monthly mean and avoids the daily loss of certain decimal parts of a degree.

The very equable temperature of the Hill is again confirmed by a reference to Table 12, which gives the mean daily range of temperature as recorded by the protected thermometer. I have selected this table in order that some comparison may be drawn with other instruments under similar conditions of exposure. We here find the greatest annual variation to be only $3^{\circ}4$ in the course of the eleven years, while during the last five it has been less than one degree. Referring to the mean daily range at well-known inland health resorts, I obtain the following data respecting the few such places mentioned in the "Meteorological Record" for the year 1881, which I here insert by way of comparison with Crowborough:—

MEAN DAILY RANGE OF TEMPERATURE.

Crowborough	...	...	...	12 ^o ·5
Buxton	...	...	...	14·1
Aspley Guise	...	...	...	14·9
Cheltenham	...	..	...	16·2

In Vol. iv., p. 117, of the "Quarterly Journal of the Meteorological Society," Dr. Tripe has given a comparative table of the mean daily range of temperature at the following places, which probably represent the mildest winter temperature of the British Isles, and even with these the climate of Crowborough in this respect compares very favourably during the months of December, January, and February, as the following extract from Dr. Tripe's table will render apparent.

The period for comparison refers to the five years 1873-77 both inclusive :—

MEAN DAILY RANGE OF TEMPERATURE.

1873-77.	Dec.	Jan.	Feb.	Mean.
Scilly Isles... ..	6 ^o ·1	6 ^o ·3	5 ^o ·4	5 ^o ·9
Penzance	5·2	5·4	5·3	5·3
Guernsey	7·6	7·8	7·5	7·6
Ventnor	6·7	7·0	7·7	7·1
Crowborough	7·4	8·3	8·3	8·0
Torquay	9·0	8·2	7·6	8·3
Llandudno... ..	8·0	10·1	9·2	9·1
Barnstaple	9·1	9·4	9·0	9·1

The above table has no reference to the actual winter

temperature of the above places, all of which have a much higher mean than Crowborough, but merely to the question of equability of temperature, which is a point of the highest importance—hence the following quotation from Celsus: “*Ex tempestatibus verò optimæ æquales sunt, sive frigidæ, sive calidæ ; pessimæ, quæ maximè variant,*” and hence the practice of sending delicate invalids to the Engadine for a winter residence, notwithstanding the much lower temperature which is found prevalent there than at the favourite British health resorts.

It will probably occasion some surprise that in point of equability of temperature during winter Crowborough should stand next to Ventnor, upon the average of the five years, and that this average of 8° is so nearly that for the eleven years, viz., $8^{\circ}\cdot 2$!

Crowborough is not so far distant from the sea coast but that it enjoys occasionally the refreshing influence of the sea breezes, which bring with them abundance of ozone and other invigorating products, which are found to be most agreeable during the hot days of summer, as they entirely prevent that oppressive sultriness which pervades less elevated positions.

If we omit the results of the cold year 1879 we observe how slight has been the annual variation from the mean of the series, and that the years 1882, 1883, and 1884 were all warmer than any of those preceding them.

CHAPTER III.

THE RAINFALL AT CROWBOROUGH—STORAGE OF WATER —PREVALENT WINDS, &c.



CROWBOROUGH has, upon the average, the heaviest rainfall in the county of Sussex, and this is due in all probability to its elevation above the sea. It must not be inferred, however, from this statement, that the number of wet days is proportionate, for as a matter of fact they are less than at Uckfield and the surrounding district ; but the rain, during its continuance, falls more heavily, and the individual drops are frequently of large size from the great condensation of moisture which so frequently occurs on elevated ground. Any amount of rain quickly disappears from the surface, either on account of the gradual slope, on every side, or from its rapid absorption by the porous soil. A knowledge of the actual rainfall is very important to the community of any locality if they should be disposed to avail themselves of the information. In dry seasons, for instance, the amount of deficiency ought to be known, and the indiscriminate and wasteful use of both spring and rain water prevented. Hence the advantage of having the water supply of every district under proper regulation and control. To those who take pleasure in the observance of natural phenomena, a register of the rainfall becomes a source of great interest,

and we seldom find that when once commenced it is ever discontinued except from unavoidable circumstances ; moreover, the longer it can be continued the greater becomes the attached importance and usefulness. From a careful examination of the registers at Crowborough, Maresfield,* and Uckfield, the annual amount of rain would appear to increase, in fair ratio, as elevation above the level of the sea increases, and maintains a very uniform difference year by year. Although my register at Crowborough has been kept for the last fourteen years, yet it must not be supposed to give more than an approximate average of the monthly and annual rainfall ; but my register at Uckfield, from its much longer continuance, may be considered to give such accurate details as can seldom be obtained for any one locality, and of which I purpose giving some particulars presently. It is often an extremely interesting study to watch, from an elevated position, the wonderful formation and change in some varieties of composite cloud ; the commencement, course, and dispersion of showers and thunderstorms, extending over an area of at least a thousand square miles. In the case of showers approaching from the southward they appear very often to advance near the South Downs in a somewhat narrow column, especially when near Beachy Head, but upon descending over the Weald they suddenly extend, and, spreading over a large area of country, pass to the eastward of Crowborough. When, however, they appear nearer Brighton the extension assumes a similar character, but the main body of the shower passes to the westward of Crowborough in the direction of Hayward's Heath and Horsham ; so that it frequently happens that showers are passing both to the eastward and westward of Crowborough

* Forest Lodge.

at the same time. The showers which come over the Hill generally approach from a point to the westward of New-haven, and are generally heavy, but of short continuance. The number of wet days (Table 25) must be understood to mean, in a scientific point of view, whenever a measurable quantity ($\cdot 01$ of an inch) has fallen at any time during the twenty-four hours ending at 9 a.m. It rarely happens that one inch and upwards of rain is registered in this county during any twenty-four hours; nevertheless, Table 24 gives a list of such instances—and shows that the entire year 1883 passed away without such an occurrence. The average number of wet days will be found to correspond very closely with the average amount of monthly rainfall. November has the largest number of wet days, and May the least. Table 26 is introduced as being related to the rainfall, and gives the mean daily amount of cloud above the horizon at 9 a.m., “0” representing a cloudless sky, and “10” when it was entirely overcast; nevertheless the annual results do not correspond with dry and wet years respectively, for we find that the amount of cloud in the wet year 1877 was 6·7, and in the very dry year 1884 as much as 7·0; 1872 was a wet year, and the rainfall upwards of twelve inches in excess; 1877 was also a wet year, and had an excess of more than eight inches; but for the years 1883 and 1884 the total deficiency was thirteen inches, a quantity representing approximately one thousand three hundred tons of water less per acre than usual.

During the consecutive months of December, 1876, and January, 1877, upwards of nineteen inches of rain were registered, which represent an unusually heavy fall for the South of England. Generally, the autumnal rains are the heaviest, and more uniformity in the amount is observed

than in either of the other seasons. The spring season is dry, with but few exceptions, and it is also at this time that we notice the usual indications of approaching drought. Table 23 gives the rainfall of the respective seasons, and exhibits the great difference in the amount in some consecutive years. Thus for the winter 1876-77 we find the total quantity to have been twenty-one inches, and during the following winter less than eight. These heavy winter rains occasion extensive floods in various parts of Sussex, and some of the low-lying districts are sometimes for several days, and even weeks, under water.

TABLE 22.

The Rainfall at Crowborough.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total Mean.
1871.	2.89	2.34	1.65	4.77	0.72	4.76	3.40	1.64	4.03	2.98	0.70	2.24	32.12
1872.	7.46	2.80	2.91	1.05	4.92	4.26	2.89	1.89	2.10	6.01	7.39	6.68	50.36
1873.	4.16	2.30	2.52	0.83	1.69	3.47	2.84	3.76	3.53	5.90	3.33	1.19	35.52
1874.	2.64	2.45	1.21	2.73	0.82	2.48	1.60	3.08	3.67	5.12	3.36	3.60	32.76
1875.	5.00	1.44	1.14	1.24	1.83	3.72	6.01	2.16	2.07	5.54	5.33	1.94	37.42
1876.	1.60	4.56	3.51	3.22	1.25	1.61	0.85	4.63	5.59	1.34	3.25	9.02	40.43
1877.	9.18	2.82	3.01	2.92	2.44	1.07	3.37	4.23	1.41	3.95	9.04	2.91	46.85
1878.	1.98	2.42	1.89	4.05	5.29	2.51	1.01	5.37	1.81	3.96	5.32	2.73	38.34
1879.	3.74	4.72	1.30	4.93	3.70	3.87	4.71	6.56	3.95	1.08	1.31	1.28	41.15
1880.	0.47	4.22	1.41	2.12	0.28	2.52	3.82	0.89	3.95	7.95	4.69	3.93	36.25
1881.	2.01	4.20	3.30	0.53	1.57	2.64	1.88	5.75	3.52	3.52	5.79	4.49	39.20
1882.	2.04	2.22	1.85	4.00	1.08	2.86	4.78	1.88	3.88	8.30	4.54	3.75	41.18
1883.	3.16	4.94	1.28	1.84	2.56	2.25	2.86	1.38	4.49	3.16	5.35	1.78	35.05
1884.	3.32	2.19	2.48	1.27	0.84	1.67	2.40	1.22	4.90	1.48	1.24	4.65	29.16
Average	3.58	3.11	2.10	2.53	2.07	2.83	3.03	3.17	3.48	4.30	4.33	3.58	38.16

TABLE 23.

The Rainfall of the Seasons.

Year.	Winter.*	Spring.	Summer.	Autumn.
1871 .	9.76	7.14	9.80	7.71
1872 .	12.50	8.88	9.04	15.50
1873 .	13.14	5.04	10.07	12.76
1874 .	6.28	4.76	7.16	12.15
1875 .	10.04	4.21	11.89	12.94
1876 .	8.10	7.98	7.09	10.18
1877 .	21.02	8.37	8.67	14.40
1878 .	7.31	11.23	8.89	11.09
1879 .	11.19	9.93	15.14	6.34
1880 .	5.97	3.81	7.23	16.59
1881 .	10.14	5.40	10.27	12.83
1882 .	8.75	6.93	9.52	16.72
1883 .	11.85	5.68	6.49	13.00
1884 .	7.79	4.59	5.29	7.62
Average . .	10.27	6.71	9.04	12.13

* Commencing with the previous December.

TABLE 24.

The Number of Days in each Month and Year when Rain fell to the amount of .01 of an inch and upwards during the 24 Hours ending at 9 a.m.

	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1873.	17	7	14	13	11	10	9	14	12	19	14	7	147
1874.	11	9	11	10	8	9	8	16	15	18	12	13	140
1875.	21	11	6	8	10	13	17	8	11	17	18.	13	153
1876.	11	18	22	15	7	12	7	12	18	9	16	24	171
1877.	25	19	21	16	13	7	14	16	10	14	21	16	192
1878.	11	13	8	15	21	14	7	23	8	12	18	12	162
1879.	8	19	10	18	19	18	16	18	12	9	6	10	163
1880.	6	18	5	13	4	17	20	6	11	17	14	17	148
1881.	11	13	13	11	11	10	11	20	14	19	19	13	165
1882.	8	9	13	13	9	20	20	13	11	19	20	19	174
1883.	17	17	13	6	9	13	18	16	19	14	18	14	174
1884.	17	14	7	10	10	7	14	7	13	12	8	17	136
Mean . .	13.5	13.9	11.9	12.3	11.0	12.5	13.4	14.0	12.8	14.9	15.3	14.5	160

TABLE 25.

Instances of Heavy Rains between May 1st, 1872, and December 31st, 1884, wherein the amount exceeded One Inch for any 24 Hours ending at 9 a.m.

Inches.	1878, April 10 . .	Inches.	1881, Aug. 12 . .	Inches.
1872, May 17 . .	1878, April 10 . .	1881, Aug. 12 . .	1881, Aug. 12 . .	1872, May 17 . .
1.24	1.33	1.04	1.04	1.24
1872, July 30 . .	1878, May 28 . .	1881, Aug. 25 . .	1881, Aug. 25 . .	1872, July 30 . .
1.27	1.25	1.12	1.12	1.27
1872, Oct. 30 . .	1878, Oct. 25 . .	1881, Oct. 22 . .	1881, Oct. 22 . .	1872, Oct. 30 . .
1.09	1.33	1.40	1.40	1.09
1873, July 15 . .	1879, Jan. 1 . .	1881, Nov. 26 . .	1881, Nov. 26 . .	1873, July 15 . .
1.51	1.25	2.04	2.04	1.51
1874, Feb. 26 . .	1879, April 27 . .	1882, Sept. 28 . .	1882, Sept. 28 . .	1874, Feb. 26 . .
1.20	1.03	1.04	1.04	1.20
1874, Nov. 28 . .	1879, May 28 . .	1882, Oct. 21 . .	1882, Oct. 21 . .	1874, Nov. 28 . .
1.06	1.52	2.03	2.03	1.06
1875, July 14 . .	1879, Aug. 19 . .	1882, Oct. 27 . .	1882, Oct. 27 . .	1875, July 14 . .
1.38	1.54	1.11	1.11	1.38
1875, " 15 . .	1879, Sept. 23 . .	1884, March 3 . .	1884, March 3 . .	1875, " 15 . .
1.30	1.20	1.23	1.23	1.30
1875, Aug. 28 . .	1880, Sept. 14 . .	1884, Sept. 3 . .	1884, Sept. 3 . .	1875, Aug. 28 . .
1.32	1.15	2.06	2.06	1.32
1876, Aug. 19 . .	1880, Oct. 9 . .			1876, Aug. 19 . .
1.27	2.67			1.27
1877, Jan. 10 . .	1881, " 26 . .			1877, Jan. 10 . .
1.02	1.27			1.02
1877, Aug. 25 . .	1881, Feb. 19 . .			1877, Aug. 25 . .
1.22	1.28			1.22
1877, Nov. 11 . .	1881, June 5 . .			1877, Nov. 11 . .
1.24	1.37			1.24

TABLE 26.

Mean Monthly Amount of Cloud at 9 a.m.
0—10.

	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1874.	6.2	5.8	6.6	5.7	6.5	5.4	4.4	5.8	6.4	7.2	6.5	7.2	6.1
1875.	8.2	7.1	8.1	5.5	5.0	6.1	7.4	6.6	5.8	7.0	8.3	8.2	6.9
1876.	8.2	8.0	7.2	6.4	6.6	5.6	6.0	4.5	6.8	7.6	7.0	8.8	6.9
1877.	7.2	8.2	6.7	9.0	7.7	4.6	6.6	7.0	6.0	5.5	6.1	6.6	6.7
1878.	7.5	8.0	7.8	7.2	7.5	7.2	5.7	7.7	5.1	7.0	7.3	7.4	7.1
1879.	8.4	8.6	7.1	8.0	7.7	8.7	9.2	7.4	6.8	7.5	7.8	7.0	7.8
1880.	6.2	7.8	5.7	7.8	6.4	8.4	8.2	8.6	7.0	7.8	6.8	7.9	7.3
1881.	7.1	8.2	6.3	7.1	5.7	6.0	4.8	6.7	7.9	6.2	8.1	7.7	6.8
1882.	8.7	7.8	5.3	6.6	5.7	8.6	7.9	8.3	7.0	7.4	5.5	8.0	7.2
1883.	7.2	7.5	6.6	7.1	6.2	6.0	7.9	6.0	6.9	7.3	6.4	8.4	6.9
1884.	7.7	8.0	6.6	7.5	5.3	6.9	7.3	3.6	7.3	7.6	7.8	9.0	7.0
Mean . .	7.5	7.7	6.7	7.0	6.4	6.7	6.8	6.5	6.6	7.1	7.0	7.8	6.9



BEFORE closing my remarks upon the rainfall of Crowborough I will mention a subject intimately connected therewith—viz., its storage in suitable tanks and reservoirs.

Although the consideration of this question is a matter of such great importance in our domestic economy, yet it is quite remarkable how little care is taken by the majority of communities, and private individuals, to ensure a sufficient store of the element which is one of the first essentials of a healthy life; and we know that to the want of a needful supply of pure water, whether the source be from spring or rainfall, are due many of the ailments and no small proportion of the present mortality of the people. The remarkable difference in the fall of rain which has occurred in some consecutive years affords suggestive data for ensuring such a storage of the one as shall supply the deficiency of the other. The rainwater which falls from our roofs is in far greater quantity than most persons would credit, and the large surplus of which runs to absolute waste. Many householders are content with a tub, or a small tank, the size of which is wholly out of proportion to the requirements of the family; especially when we take into consideration its rapidly increasing use for domestic purposes. As a rule, it may be taken for granted that if the rainwater which falls upon any house or cottage be *all* stored upon a scale, which I shall presently mention, such quantity will be quite sufficient for the use of the inmates; but none must be allowed to run to waste until the requisite amount for storage has been secured.

It has been estimated that the actual quantity of liquid consumed by a man in active life is about 180 gallons per annum, and by women and children considerably less; and it will probably be a fair estimate to consider the three classes would consume upon the average, per head, 120 gallons per annum. If we ascertain by reference to Mr. Symons's Rainfall Report that the average fall of rain in Sussex for the year 1873 amounted to 28·34 inches, this would indicate that about 133 gallons of water must have fallen upon every square yard of ground in that year, (at Crowborough it would be 166 gallons)—a quantity which would be more than sufficient to supply one person with drinking water, supposing that means were adopted to secure this quantity before it became contaminated by deleterious substances. I select the year 1873 as being one which had a rainfall so nearly equal to the average of many years.

Assuming, then, that 133 gallons of water fall upon every square yard of surface, it will not be a very difficult matter to ascertain, from the area of the roof of any house or building, how much water might be collected from it, and from thence to calculate the required size of a reservoir.

When estimating the size of a reservoir, which will be sufficiently large for all purposes in time of drought, we should take care to have it *large enough*; and for the supply of a household consisting of ten persons, storage should be provided at the rate of twelve hundred gallons for every inmate. This amount will probably be found sufficient when *once* obtained, for the incoming at every shower will tend to restore the daily consumption. A reservoir, therefore, measuring 30 feet long, 12 wide, and $5\frac{1}{2}$ in depth, will hold 12,335 gallons. Although a tank of this size should be 12 feet wide at the top, yet it should not be more than eleven

feet at the bottom, which will allow such a slope from bottom to top as will prevent the mischance of frost bursting the side by expansion. As an illustration of the necessity for this precaution, let anyone fill an ordinary upright tumbler with water, and also a V shaped wine glass, or other vessel, likewise filled with water, and expose them to the action of severe frost. It will then be found that the tumbler has been cracked on one side, and that the other vessel has not been injured—in fact it would be impossible to split, by the action of frost, the V shaped glass.

Another reason for building a reservoir of full size is, that the greater its capacity, the better will its contents keep fresh, and the less waste there will be from evaporation. It should be sunk so far in the ground that the *top* should be two feet below the surface, which protects it much from frost; and the shelving bank above it should be at such a distance as will prevent any soil washing into it during heavy rains. The tank need not be arched or covered over in any way, but kept fully exposed to the action of sun and weather, and, provided that ordinary care be taken in preventing the admission of deleterious substances, the water will remain fresh and good for any purpose it may be required.

Probably few persons are aware of the vast weight of rain-water which falls annually upon an acre of ground in this southern county. Referring again to the year 1873, and to the average quantity of 28.34 inches, we find that its weight per acre will be 2,862 tons, assuming that an inch in depth weighs one hundred and one tons per acre. The number of acres in the county of Sussex is 933,269—then $933,269 \times 2862 = 2,671,015,878$ tons of water! This quantity, then, falls annually in the county, which in gallons would amount to the number of 598,334,000,000. I have previously

mentioned that the amount of storage per head of population should be 1,200 gallons ; and it is a curious fact that the quantity required for this purpose—viz., 588,606,000 gallons—falls upon the small number of 918 acres, thus leaving an enormous balance to be distributed for the supply of cattle, vegetable, and all trade necessities.

WIND.

The following tables respecting the direction of winds are the results of observations taken daily at nine a.m. Although the S.W. wind has been the most prevalent, as we generally find to be the case in the South of England, yet its direction on the Hill frequently differs from that passing over the lower ground—sometimes, indeed, passing in an exactly opposite direction. I notice occasionally that the interchange of currents is very rapid and fluctuating in the course of twenty-four hours. Of late years the N.E. current has been frequently very persistent, and upon the average of years, ranks next in frequency to the S.W. Westerly winds are much less frequent than at Uckfield.

TABLE 27.

The Prevalent Direction of Wind at 9 a.m. in each Month and Year—referred to
Eight Points of the Compass.

Months.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
January . .	S.W.	S.	S.	S.	S.W.	N.E.	N.	N.	S.W.	S.W.	S.W.
February . .	S.	N.E.	S.W.	W.	S.	N.	S.	N.E.	S.	S.	S.E.
March . .	S.W.	N.E.	W.	N.	N.	N.E.	N.E.	W.	S.W.	N.E.	N.
April . .	S.W.	N.E.	S.	N.	E.	N.	S.W.	N.E.	S.W.	N.E.	N.E.
May . .	N.E.	S.	N.E.	S.W.	S.	N.	N.E.	N.E.	S.W.	N.E.	N.E.
June . .	N.E.	S.W.	S.	S.W.	S.W.	S.	S.W.	S.	W.	N.E.	N.E.
July . .	S.W.	N.E.	S.W.	S.W.	N.E.	S.W.	S.W.	S.W.	S.W.	S.W.	S.W.
August . .	S.W.	S.	S.W.	S.W.	S.W.	S.W.	N.E.	S.W.	W.	S.W.	S.W.
September . .	S.	N.E.	W.	N.E.	S.W.	S.	W.	N.	N.	S.W.	S.W.
October . .	S.	N.E.	S.	N.	S.	N.E.	N.E.	N.	W.	W.	N.
November . .	N.W.	N.E.	N.	S.	N.	N.	N.E.	S.W.	W.	S.W.	N.
December . .	N.W.	S.W.	S.	N.W.	N.	N.	S.W.	S.	S.W.	N.	S.W.
Most prevalent .	S.W.	N.E.	S.	S.W.	S.W.	N.	N.E.	N.	S.W.	S.W.	S.W.

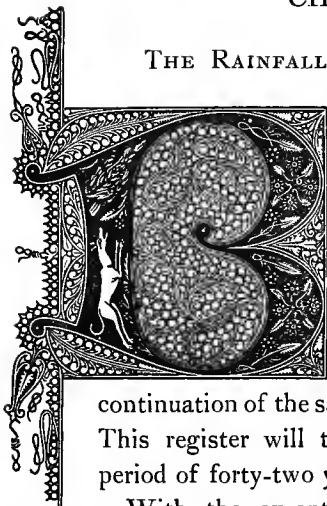
TABLE 28.

The Number of Days in each Year when the Principal Direction of the Wind was from the following Eight Points of the Compass respectively at 9 a.m.

	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
1874	12	65	16	37	41	87	23	84
1875	46	65	12	52	32	90	26	42
1876	59	36	23	30	76	64	41	37
1877	49	30	6	17	52	87	79	45
1878	66	33	35	21	52	67	48	43
1879	67	51	27	34	52	69	35	30
1880	54	84	28	19	38	90	36	17
1881	55	69	13	29	52	78	46	23
1882	52	43	19	38	45	79	67	22
1883	55	62	16	31	40	78	54	29
1884	42	75	24	36	38	72	53	26
Average . . .	50	55	19	31	47	78	46	36

CHAPTER IV.

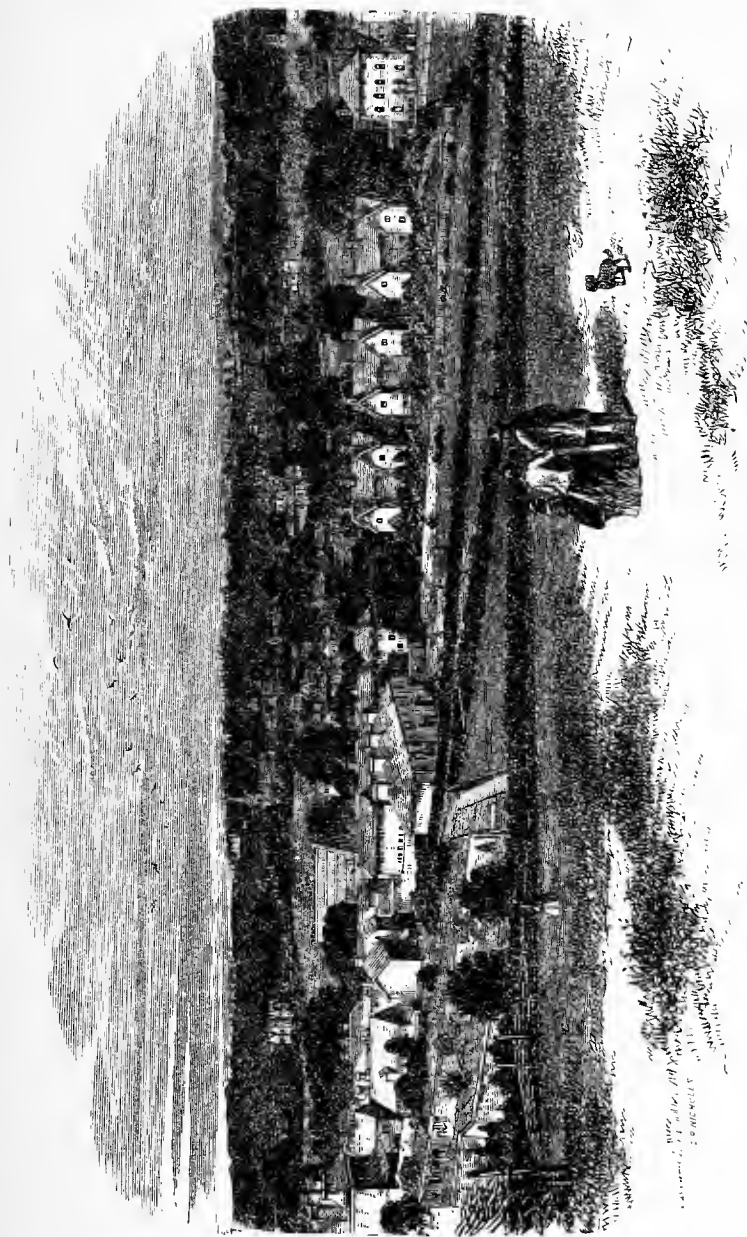
THE RAINFALL AT UCKFIELD, SUSSEX.



BEING desirous of giving some further results of my long register of the rainfall at Uckfield, I will take this opportunity of reprinting such portions of it as appeared in my work on the climate of that place, and of adding thereto a continuation of the same to the end of the year 1884. This register will then be complete for the long period of forty-two years.

With the exception of some registers kept at Chichester and its neighbourhood, I am not aware that any observations of rainfall were taken, with any regularity, in this county previous to the commencement of my own register in July, 1842; and I may here mention the curious fact that not a single shower passed over Uckfield during that month, a circumstance which has never occurred in any separate month from that time to the present. It was, however, very nearly repeated in September, 1865, when one shower fell, but only to the trifling amount of $\cdot 02$ of an inch.

Since the year 1877, I have been indebted to the kindness of Miss Laura Day, of Uckfield House, for a continuance of the register; and I should mention that in consequence of this change of position a new gauge of eight inches in diameter, and placed eight inches above the ground, was sub-



VIEW OF UCKFIELD FROM THE SOUTH.

1871.

stituted for my old instrument, which had a diameter of twelve inches, and was placed six feet above the ground, also its elevation above sea-level was increased fifty feet, viz., to 200 feet. Although from a few observations which I made some years since, when I had placed the two instruments side by side at their respective heights above the ground, I found great uniformity in the amount of rain collected by them, yet theoretically the eight-inch gauge in its new position should register about 1·7 per cent. more than it would have done had it remained in my former Observatory. In the subjoined tables, however, I have given the exact amount registered by Miss Day, leaving the above correction open to those who might wish to render the record more strictly comparable with that preceding the change of position, or with their own.



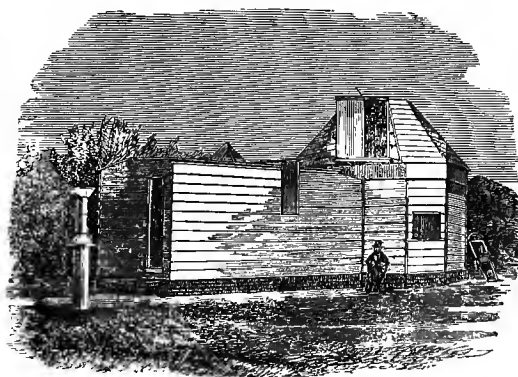
THE length of this register enables me to give a very reliable average amount of the rainfall at Uckfield; as one proof of which it may be observed that the monthly quantity gradually increases from the driest month (March) to the wettest month (October), and decreases in regular progression (January alone excepted) from the latter to the former month.

I have carefully examined the old register, and corrected a slight mistake which occurred in the year 1856. It will be seen that the month of October still maintains its character as being by far the wettest month, while at Crowborough, in consequence of the shortness of the register, the rainfall for November slightly exceeds that for October. In both series

March appears as the driest month, which obtains, I believe, generally, in the South of England. The advantage of a long register in any locality is strikingly shown by dividing the period into four decades, and ascertaining the mean annual rainfall for each; thus from 1843 to 1852, both inclusive, the average was 28·99 inches; from 1853 to 1862, 29·76 inches; from 1863 to 1872, 30·08 inches; and from 1873 to 1882, 32·16 inches. The rainfall, therefore, has steadily increased throughout the whole series of years, and completely dispels the idea that we have had less rain of late years than formerly. With respect to the last decade, the increase is greater than in those preceding; this may be, to a partial extent, owing to the increase of amount due to increase of height above the sea-level; nevertheless it must be remembered that this applies to little more than half this period, and even if we deduct the theoretical correction of 1·7 per cent. during the last six years (1877 to 1882, both inclusive), it still places the largest amount to the decade ending with 1882. The total depth of rain which has fallen during the above period (1843-84) at Uckfield amounts to rather more than 105 feet (105·22), which is represented in weight by 127,792 tons per acre, or 26 tons per square yard. If any person should wish to build a rain-water tank at Uckfield, he might reckon that upon the average of years 139·85 gallons of water would fall upon every level square yard of surface per annum.

It is still an unexplained phenomenon among the wonderful laws of Nature how such an enormous weight is suspended in our atmosphere, and by what marvellous and beneficent arrangement the rain falls in drops, instead of coming down in such masses as would necessarily prove most destructive in its distribution over the earth's surface.

All we know is that the rain is precipitated from the clouds in gentle and fertilizing drops, and in such quantities as are best calculated for cherishing the peculiar vegetation of the regions where it falls, so as to give scope to the powers of life, inherent in Nature, and to spread abundance everywhere.



MY FORMER OBSERVATORY AT UCKFIELD,
AND POSITION OF RAIN GAUGE.

TABLE 29.
The Monthly and Yearly Rainfall at Uckfield, Sussex. (In Inches.)

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1843.	2.35	2.50	0.62	2.21	5.69	1.71	3.11	3.84	0.28	4.75	2.71	0.32	30.09
1844.	3.03	3.84	2.32	0.37	0.18	0.79	1.47	2.23	0.60	5.11	2.99	0.44	23.37
1845.	2.97	1.25	0.57	1.53	2.65	1.08	1.43	2.95	3.12	1.89	2.99	0.60	23.03
1846.	3.25	1.37	1.90	1.62	1.43	0.92	2.23	2.30	1.50	5.53	1.69	1.37	25.11
1847.	1.81	1.73	0.67	0.69	1.63	1.77	0.22	1.08	1.80	1.57	2.12	2.49	17.58
1848.	1.49	3.00	2.56	3.11	0.79	3.91	3.01	6.05	2.63	6.03	2.27	3.18	33.03
1849.	2.21	2.51	0.64	3.82	2.67	0.85	1.69	0.76	3.37	5.03	1.92	3.81	29.33
1850.	1.47	2.47	0.18	3.27	2.78	2.03	2.44	2.37	2.62	1.96	4.39	2.64	28.62
1851.	4.25	1.11	4.01	2.23	0.35	1.62	3.50	1.56	0.21	4.11	0.81	0.50	24.26
1852.	5.56	1.42	0.47	0.43	2.59	7.04	0.50	6.01	6.54	8.70	6.52	4.70	50.55
1853.	4.34	0.84	1.70	2.80	1.56	1.61	3.97	3.17	2.88	7.25	0.99	0.59	31.70
1854.	2.21	0.51	0.11	0.25	3.87	2.22	2.19	1.43	1.45	4.28	2.29	2.34	23.15
1855.	0.23	0.97	3.19	0.51	2.29	1.77	3.44	0.67	0.88	6.05	1.76	2.04	23.80
1856.	2.67	1.62	1.62	4.54	4.77	1.72	2.67	1.97	6.06	1.63	1.03	3.29	33.59
1857.	3.65	0.38	2.23	2.21	1.45	3.45	2.08	3.24	4.67	4.61	2.84	0.93	31.74
1858.	1.16	0.71	1.21	2.05	2.03	0.16	3.26	1.85	1.14	1.83	1.37	2.59	19.36
1859.	2.57	2.16	1.79	2.28	1.02	1.48	1.67	1.59	3.82	4.33	5.07	5.10	33.48
1860.	4.75	1.50	3.00	2.53	4.20	4.80	3.00	5.84	3.75	2.97	2.95	3.17	42.46
1861.	0.23	1.78	2.51	0.69	1.56	2.88	2.85	1.16	3.70	1.85	7.50	1.64	28.35
1862.	2.27	0.80	4.05	1.63	2.61	2.03	1.43	1.90	2.31	7.00	0.94	3.04	30.01
1863.	3.67	0.88	0.91	0.46	1.96	3.81	0.79	2.18	3.44	3.23	1.68	2.73	25.74

TABLE 29 (continued).
The Monthly and Yearly Rainfall at Uckfield, Sussex. (In Inches.)

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1864.	0.94	1.03	3.64	1.04	1.94	1.01	0.46	1.73	3.06	2.09	5.56	0.98	23.48
1865.	5.26	1.63	1.82	0.33	3.37	1.38	4.86	3.76	0.02	11.23	3.06	2.28	38.97
1866.	6.22	4.35	1.95	1.25	0.70	2.77	2.83	2.07	6.12	1.61	1.89	2.03	33.79
1867.	3.15	1.70	3.02	2.24	2.07	1.87	5.25	1.96	2.33	3.41	1.41	2.07	30.48
1868.	4.35	1.03	1.52	2.30	1.03	0.59	2.96	3.18	3.01	2.64	1.37	6.51	30.51
1869.	3.00	2.53	2.28	1.52	3.98	0.96	0.08	1.30	4.33	1.86	2.65	4.08	28.57
1870.	1.83	1.56	1.73	0.31	1.05	0.34	2.12	2.14	2.29	5.50	2.24	3.88	24.99
1871.	2.61	1.64	1.19	3.90	0.62	3.87	2.68	1.34	3.07	2.50	0.70	1.52	25.64
1872.	5.36	1.80	1.94	0.61	3.16	2.72	1.59	1.80	1.83	5.05	6.92	5.88	38.64
1873.	3.60	2.02	2.18	0.64	1.02	2.79	2.35	3.62	3.07	4.67	3.16	0.94	30.06
1874.	2.22	1.90	0.69	2.29	0.59	2.10	0.58	1.97	3.15	4.18	2.66	2.32	24.65
1875.	3.88	1.15	0.71	0.87	1.28	3.74	3.40	1.45	1.80	4.74	4.82	1.18	29.02
1876.	0.96	3.05	3.07	2.63	0.91	1.88	0.45	3.92	4.23	1.09	3.23	7.95	33.37
1877.	7.07	2.25	2.49	2.51	2.15	1.02	3.49	3.34	1.28	3.79	7.68	2.51	39.58
1878.	1.60	2.05	1.65	3.12	3.86	1.55	1.03	4.13	1.78	4.37	4.03	2.08	31.25
1879.	3.32	4.13	0.95	3.52	3.11	3.29	3.53	4.80	3.28	0.77	1.27	1.03	33.00
1880.	0.49	3.05	0.88	1.81	0.20	2.02	3.50	1.08	4.16	6.72	4.26	3.62	31.79
1881.	1.40	4.43	2.71	0.80	1.22	2.19	1.46	5.18	3.24	2.54	4.36	3.52	33.05
1882.	1.51	1.80	1.43	3.10	1.06	2.11	4.57	2.14	3.27	7.78	3.82	3.26	35.85
1883.	2.73	4.27	1.24	1.38	2.62	2.32	2.31	0.63	3.13	2.88	4.59	1.39	29.49
1884.	2.85	1.69	2.03	1.31	0.23	2.28	1.62	1.22	3.64	1.08	1.07	4.14	23.16
Mean of 42 years.	2.868	1.962	1.800	1.827	2.006	2.153	2.335	2.545	2.830	4.053	3.051	2.635	30.065

TABLE 30.

The Rainfall during the several Seasons of the Year at
Uckfield.

YEAR.	WINTER.	SPRING.	SUMMER.	AUTUMN.
Commencing previous December.	December. January. February.	March. April. May.	June. July. August.	Sept. Oct. Nov.
1843 .	6.14	8.52	8.66	7.74
1844 .	7.19	2.87	4.49	8.70
1845 .	4.66	4.75	5.46	8.00
1846 .	5.22	4.95	5.45	8.72
1847 .	4.91	2.99	3.07	5.49
1848 .	6.98	6.46	12.97	10.93
1849 .	7.90	7.13	3.30	10.37
1850 .	7.75	6.23	6.84	8.97
1851 .	8.00	6.59	6.68	5.13
1852 .	7.48	3.54	13.55	21.76
1853 .	9.88	6.06	8.75	11.12
1854 .	3.31	4.23	5.84	8.02
1855 .	3.54	5.99	5.88	8.69
1856 .	6.33	10.93	6.16	8.72
1857 .	7.32	5.89	8.77	12.12
1858 .	2.80	5.29	5.27	4.34
1859 .	7.32	5.09	4.74	13.82
1860 .	11.35	9.73	13.64	9.67
1861 .	5.18	4.76	6.89	13.05
1862 .	4.71	8.29	5.36	10.25
1863 .	7.59	3.33	6.78	8.35

TABLE 30 (*continued*).

The Rainfall during the several Seasons of the Year at
Uckfield.

YEAR.	WINTER.	SPRING.	SUMMER.	AUTUMN.
Commencing previous December.	December. January. February.	March. April. May.	June. July. August.	Sept. Oct. Nov.
1864 .	4·70	6·62	3·20	10·71
1865 .	7·87	5·52	9·97	14·31
1866 .	12·85	3·90	7·67	9·62
1867 .	6·88	7·33	9·08	7·15
1868 .	7·45	4·85	6·75	7·02
1869 .	12·04	7·78	2·34	8·84
1870 .	7·47	3·09	4·60	10·03
1871 .	8·13	5·71	7·89	6·27
1872 .	8·68	5·71	6·11	13·78
1873 .	11·50	3·84	8·76	10·90
1874 .	5·06	3·57	4·65	9·99
1875 .	7·35	2·86	8·59	11·36
1876 .	5·19	6·61	6·25	8·55
1877 .	17·27	7·15	7·85	12·75
1878 .	6·16	8·63	6·71	10·18
1879 .	9·53	7·58	11·62	5·32
1880 .	4·57	2·89	6·60	15·14
1881 .	8·45	4·75	8·83	10·14
1882 .	6·83	5·59	8·82	14·92
1883 .	10·26	5·24	5·26	10·60
1884 .	5·93	3·57	5·12	5·79
Mean of 42 years }	7·37	5·62	7·03	9·93

TABLE 31.

The following are instances of Heavy Rainfall, together with their Date and the Amount. In Inches.

Year.	Month.	Rainfall.	Year.	Month.	Rainfall.
1843	Aug. 23	1.47	1871	June 14	1.41
1849	April 19	1.40	1872	Jan. 23	1.02
"	Oct. 4	1.69	"	May 17	1.11
1850	Nov. 14	1.47	1873	Jan. 18	1.05
1851	Aug. 28	1.30	"	July 13	1.33
1852	Oct. 4	2.12	1874	Feb. 26	1.04
"	" 25	1.77	"	Oct. 6	1.17
1853	July 14	1.79	1875	June 30	1.23
"	Aug. 23	1.29	"	July 14	1.20
"	Sept. 21	1.27	"	Nov. 7	1.04
1854	Oct. 7	1.42	1877	Jan. 2	1.06
1856	Sept. 27	2.38	"	Oct. 24	1.30
1857	June 11	1.41	"	Nov. 24	1.05
1861	Nov. 5	1.27	1878	Oct. 25	1.32
"	" 13	1.52	1879	Jan. 1	1.29
1862	Oct. 20	1.53	"	May 28	1.34
1864	Nov. 15	1.30	"	Aug. 19	1.17
"	" 23	1.40	1880	Sept. 14	1.25
1865	July 23	1.30	"	Oct. 9	1.72
"	Oct. 18	2.40	"	" 26	1.12
"	" 26	1.41	1881	Feb. 19	1.95
"	" 30	1.22	"	June 5	1.06
1866	Jan. 11	1.89	"	Oct. 22	1.10
1867	June 2	1.47	"	Nov. 26	1.30
"	July 25	1.33	1882	Sept. 19	1.05
1868	July 11	2.10	"	Oct. 21	1.50
"	Aug. 17	1.18	1884	Oct. 3	1.84
1869	Dec. 16	1.16			
1870	Oct. 22	1.26			

TABLE 32.

The Monthly and Annual Number of Wet Days—*i.e.*, wherein the Fall of Rain and Melted Snow amounted to One Hundredth of an Inch and upwards during the 24 hours ending at 9 a.m.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1843.	17	18	7	18	23	13	15	12	4	16	25	10	178
1844.	15	18	17	4	5	8	10	14	9	21	15	4	140
1845.	16	11	11	13	25	11	18	17	14	11	18	19	184
1846.	16	11	16	15	7	5	12	11	8	21	9	6	137
1847.	10	10	7	8	12	11	4	10	11	13	13	13	122
1848.	10	18	20	17	6	18	13	23	9	23	15	16	188
1849.	19	10	10	21	11	6	11	8	12	19	10	14	151
1850.	9	11	6	14	14	10	12	15	8	11	15	13	138
1851.	20	7	16	13	5	6	14	5	6	13	7	8	120
1852.	17	12	2	3	11	23	4	19	15	16	23	23	168
1853.	17	7	5	10	9	11	14	7	10	20	8	3	121
1854.	16	6	4	5	16	9	8	9	5	11	13	15	117
1855.	3	5	14	7	12	10	15	10	6	23	11	10	126
1856.	19	10	3	14	21	7	10	13	17	12	9	12	147
1857.	16	7	13	14	7	9	11	11	18	16	13	8	143
1858.	6	7	6	11	17	4	15	8	12	11	6	14	117
1859.	10	13	10	12	9	11	8	8	17	15	14	14	141
1860.	18	10	19	11	15	18	12	23	17	13	10	13	179
1861.	2	15	17	4	7	13	20	8	15	10	18	11	140
1862.	17	5	20	10	14	14	13	10	12	20	11	16	162
1863.	19	9	8	9	8	13	2	15	12	17	10	11	133

TABLE 32 (continued).

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1864.	18	11	13	6	7	8	4	6	13	7	14	6	113
1865.	15	12	11	3	9	5	11	14	1	16	13	10	120
1866.	15	15	12	10	8	10	8	14	20	9	12	16	149
1867.	17	12	15	13	13	5	15	11	9	15	5	10	140
1868.	13	7	18	11	5	4	6	11	10	12	7	23	127
1869.	17	16	14	10	16	5	2	7	12	7	9	16	131
1870.	16	9	7	4	6	4	8	11	7	17	11	13	113
1871.	15	14	10	17	3	12	16	6	8	12	7	11	131
1872.	21	17	13	7	15	13	11	13	8	20	26	19	183
1873.	18	7	13	13	11	10	9	16	9	19	13	7	145
1874.	10	8	10	10	5	9	5	13	12	17	10	11	120
1875.	20	10	5	5	8	10	13	5	10	17	18	12	133
1876.	10	15	21	15	7	11	6	12	16	8	15	24	160
1877.	25	18	18	16	14	7	17	16	12	15	24	16	198
1878.	16	13	10	18	22	14	10	24	10	15	20	15	187
1879.	12	23	12	21	23	23	23	19	11	12	11	13	203
1880.	7	21	5	17	4	18	24	8	15	19	17	21	176
1881.	12	18	13	15	11	11	12	24	19	21	24	22	202
1882.	9	13	17	16	11	19	21	18	19	23	22	23	211
1883.	23	17	17	8	12	14	18	13	20	15	22	17	196
1884.	16	18	11	14	7	10	15	7	14	14	6	21	153
Mean of 42 years.	14·7	12·2	11·8	11·5	11·2	10·7	11·8	12·5	11·7	15·3	13·8	13·8	151·

CHAPTER V.

ON THE METEOROLOGICAL CHARACTER OF THE SEVERAL MONTHS OF THE YEAR, TOGETHER WITH VARIOUS REMARKS IN REFERENCE THERETO.*

JANUARY.

“ When all this uniform, uncoloured scene
Shall be dismantled of its fleecy load,
And flush into variety again.
From dearth to plenty, and from death to life,
Is Nature’s progress, when she lectures man
In heavenly truth ; evincing, as she makes
The grand transition, that there lives and works
A soul in all things, and that soul is GOD.
He sets the bright procession on its way,
And marshals all the order of the year ;
He makes the bounds which winter may not pass,
And blunts his pointed fury ; in its case,
Russet and rude, folds up the tender germ,
Uninjured, with inimitable art ;
And, ere one flowery season fades and dies,
Designs the blooming wonders of the next.”

COWPER.

* These notices of the weather during the several months and years are to be considered as a continuation of some remarks (re-written) on this head which I published some years since in my work on “ The Climate of Uckfield.” When mention is made of the *average* temperature and rainfall, it should be understood that I refer to my Uckfield register, on account of its embracing a longer period than that at Crowborough. In consequence of the short distance (seven miles) between the two stations, remarks relative to the *general* character of seasons will be equally applicable ; account being taken of difference of elevation above sea level.



PREVIOUS observations stamp this month as the coldest period of the year, and in severe winters, when there has been little or no frost in the previous December, the cold usually commences during the first or second week, accompanied by a keen N.E. wind. Should a change not occur in the course of two or three days, we are nearly certain of having a fall of snow and a continuance of the frost. The mean temperature is about 38° . In continued frosty weather the temperature falls to 15° , and even lower on a clear night, after a fall of snow. It occasionally happens that these frosts are of short continuance, and are quickly succeeded by a sudden thaw; but such thaws frequently prove but temporary, and the wind soon changes by S.E. to E., and N.E., with a return of frost for perhaps a week or ten days longer. On these occasions the trees are beautifully decked with rime, and present a splendid appearance when dazzling in the solar rays of the early morning. In our very uncertain climate we occasionally find that great mildness prevails during the month, when the fall of rain is, almost invariably, above the average. This was especially the case in the years 1846, 1851, 1853, 1866, and 1877. In 1846 and 1866 the weather was often too warm to bear fires with comfort. Very strong S.W. winds are frequent in such a season, which increase to a hurricane if long continued, and occasion great depression of the barometer.

On the other hand, we had very cold weather in the years 1850, 1861, 1867, 1871, and 1881. The heaviest snow which we have had for many years occurred in 1881, which

is still fresh in our memory. For many years past the fall of snow in this county has been trifling as compared with the Midland counties. On the high ground of Crowborough the snow lies sometimes for many days, in consequence of the dryness of the air. In very severe weather snow crystals fall in abundance, which are well worthy of attentive examination under a magnifying-glass. These crystals are wholly different from ordinary snow, and although they all, without exception, assume the hexagon form, yet their internal structure presents some wonderful varieties of crystallization.

FEBRUARY.

“ From sunward rocks the icicle’s faint drop
 By lonely river side is heard at times
 To break the silence deep, for now the stream
 Is mute, or faintly gurgles far below
 Its frozen ceiling. Silent stands the mill,
 The wheel immoveable and shod with ice.
 The babbling rivulet at each little slope
 Flows scantily beneath a lucid veil,
 And seems a pearly current liquefied ;
 While at the shelvy side in thousand shapes
 Fantastical the frostwork domes uprear
 Their tiny fabrics, gorgeously superb
 With ornaments beyond the reach of art.
 Here vestibules of state and colonnades,
 There gothic castles, grottoes, heather fanes,
 Rise in review and quickly disappear ;
 Or through some fairy palace fancy roves,
 And studs with ruby lamps the fretted roof,
 Or paints with every colour of the bow
 Spotless parterres, all freaked with snow-white flowers—
 Flowers that no archetype in nature own ;
 Or spreads the spiky crytsals into fields
 Of bearded grain, rustling in autumn breeze.”

GRAHAME.



HIS is the last month of winter, and extremely variable in its character. There is an old proverb—

“February fill dyke, be it black or be it white,
But if it be white it’s the better to like,”

but more recent observations tend to set aside the old proverb, as February, next to March, is the driest month of the year in Sussex. In severe winters, the frosts of the two previous months continue, or return with great intensity; while on several occasions the greatest cold of the year has occurred in this month. It was a very cold month in the years 1845, 1847, 1855, and 1860. Very intense frosts occur occasionally; thus, at Uckfield, on February 12, 1845, the temperature fell to 3° , and on February 12, 1847, to 1° ! as shown by thermometers protected from radiation. Snow falls occasionally, with strong N.E. winds, while at other times rain falls upon the frozen ground, so that walking or driving becomes almost an impossibility for a few hours. A very remarkable instance of this frozen rain occurred in February, 1855, which I have mentioned in another publication: but the phenomena which accompanied it was so wonderful, that I will repeat the record.

On the third of that month, about 2 a.m., a little sleet commenced falling, and an hour afterwards a heavy rain, which continued for upwards of two hours; while the temperature of the air for several feet above the earth remained below the freezing point.

By day light, the pavements, roads, as well as every tree and shrub, were completely enveloped with a coating of ice one-sixth of an inch in thickness. All houses on their S.E. aspect were entirely covered in the same way. The effect was

very extraordinary on the leaves of evergreens; and at 10 a.m., just as a thaw was commencing, an entire ice-leaf might, with care, be removed from their upper surface with all the veins and form of the true leaf delineated thereon with the accuracy of a photograph. The branches of many of the smaller shrubs were broken by the weight of the ice. At mid-day most of the trees had lost their transparent covering, when it was interesting to pick up the various forms of ice-branches which had fallen from the trees and hedges. It is recorded that a somewhat similar phenomenon happened in the day-time in the month of January, 1771, and again in 1807; on the latter occasion rooks, when attempting to fly from the trees, fell to the ground with their wings completely frozen: and for the same reason larks, plovers, and other birds were caught in the fields.

This phenomenon is thus described by Phillips in his "Letters from Copenhagen":—

" Ere yet the clouds let fall the treasured snow,
Or winds begun through hazy skies to blow,
At evening a keen eastern wind arose,
And the descending rain unsullied froze.
Soon as the silent shades of night withdrew,
The ruddy morn disclosed at once to view
The face of Nature in a rich disguise,
And heightened every object to my eyes.
For every shrub, and every blade of grass,
And every painted thorn, seemed wrought in glass;
In pearls and rubies rich the hawthorns show,
While through the ice the crimson berries glow.
The thick sprung reeds the watery marshes yield
Seem polished lances in a hostile field;
The stag in limpid currents, with surprise,
Sees crystal branches on his forehead rise.
The spreading oak, the beech, and tow'ring pine,
Glaz'd over, in the freezing ether shine;

The frightened birds the rattling branches shun,
 That wave and glitter in the distant sun.
 When, if a sudden gust of wind arise,
 The brittle forest into atoms flies ;
 The crackling wood beneath the tempest bends,
 And in a spangled shower the prospect ends."

It was a very mild month in the years 1849, 1856, 1867, 1869, 1883, and 1884.

The sun now acquires considerable influence upon vegetation, and in mild weather some of our spring flowers come into bloom towards the end of the month.

MARCH.

" While yet the spring is young, while earth unbinds
 Her frozen bosom to the western winds ;
 While mountain snows dissolve against the sun,
 And streams, yet new, from precipices run ;
 Ev'n in this early dawning of the year,
 Produce the plough, and yoke the sturdy steer,
 And goad him till he groans beneath his toil,
 Till the bright share is buried in the soil.
 That crop rewards the greedy peasant's pains
 Which twice the sun and twice the cold sustains
 And bursts the crowded barn with more than promised gains.
 But ere we stir the yet unbroken ground,
 The various course of Seasons must be found ;
 The weather, and the setting of the winds,
 The culture suited to the several kinds
 Of seeds and plants, and what will thrive and rise,
 And what the genius of the soil denies.
 This ground with Bacchus, that with Ceres suits,
 The other loads the trees with happy fruits."

A MARKED meteorological feature of this month is the prevalence of boisterous weather and gales during the second or third week, just antecedent to the vernal equinox. Although these gales usually approach from the S.W., yet we sometimes have a strong current from the N.E., which, when it lasts many days, induces a rapid evaporation from the soil.

“ March dust is worth a King’s ransom.
A dry and cold March never begs its bread.
March flowers never made summer bowers.”

Should the N.E. winds not set in till April, March is often a somewhat wet month, with the wind veering frequently between N.W. and S.W.

March, however, is sometimes a cold month, and the driest of the year. It was particularly cold in the years 1845, 1855, 1865, and 1883. The first mentioned instance was the coldest on record, and its mean temperature was several degrees lower than the average for January. Snow-storms occur occasionally, which give a very wintry appearance to the landscape, but the sun begins at this time to acquire such power that the snow seldom remains long upon the ground.

“ When Februeer is come and gone
The snow lays on a hot stone.”

It was a mild month in the years 1848, 1854, 1859, 1871, 1882, and 1884. Hence, it is more frequently mild than otherwise. In some years the latter part of the month is characterised by great warmth, and the temperature in the shade will rise to 70° and upwards. Upon the whole, however, vegetation makes but little progress, as any premature warmth is quickly followed by cold nights and chilling winds, to the great injury of any advancing foliage.

APRIL.

"Whanne that Apryll with his shoures sote
 The drought of Marche had perced the rote
 And bathed every bayne in suche lytoure
 Of whiche vertue engendred is the floure
 Whan Zephirus eke with his sote breth
 Inspired hath every holte and heth
 The tendre croppes, and the yonge sonne
 Hath in the Ram halfe his course yronne
 And smale foules maken melodye
 That slepen of nyght with open eye
 So prycketh hem nature in her conrage
 Than longen folke to go on pylgrymage
 And palmers to seken straunge strondes
 To serbe halowes couthe in sondry londes
 And specially fro every shires ende
 Of Englonde to Cannterbury they wende
 The holy blysful martyr for to seke
 That hem hath holpen whan they were scke."

CHAUCER.



PERHAPS there is no other month in the year wherein we are exposed to such great and sudden changes of temperature as in April. The increasing power of the sun's rays and easterly winds cause excessive evaporation. Some days may be warm and genial, while on the other hand days of wintry rigour are experienced with heavy showers of hail or snow. In April, 1849, a heavy fall of snow was followed by such a severe frost as to destroy all the garden fruits.

It was a very cold month in the years 1847, 1849, 1860, 1879, and 1881, and it was very mild in the years 1844, 1854, 1865, 1874, and 1882. In April, 1865, the sudden warmth, after the cold of the previous month, was very remarkable. Very wet weather seldom occurs, but the quantity of rain was above the average in the years 1848, 1856, 1871, and 1882.

Towards the close of the month, whatever may have been the general character of the weather, a large number of our spring flowers come into bloom. During the third week it is usual for the wryneck, cuckoo, nightingale, swallow, redstart, willow wren, and other migratory birds to appear—the marten and swift come later. The earlier kinds of butterfly also appear, in addition to the sulphur species, which generally appear in March and occasionally in February. During warm evenings the common bat may be seen flitting around the house. Their appearance is always welcome, and usually indicates fine weather for two or three days.

The atmosphere is occasionally very clear during showery weather, and objects, twenty or thirty miles distant, can be seen very distinctly with a telescope of moderate power.

In this month we often see large masses of the Cumulo-stratus cloud, in various directions, which can scarcely fail to attract attention.

MAY.

“ By zephyrs led comes genial May,
 With brighter green she decks the cheerful mead ;
 Breathes either bland to wake the genial seed,
 Bids the swoll’n buds their crimson folds disclose,
 And with her own warm blushes tints the rose :
 Now the plumed tenants of the copse and grove
 Disport on circling wing, and chaunt of love,
 Swelling the melody of waking birds !
 The woodman’s song, and low of distant herds !
 Where silv’ry riv’lets play through flow’ry meads
 And woodbines give their sweets, and limes their shades.
 Bathed in soft dew and fanned by western winds
 Each field its bosom to the gale unbinds !
 The blade dares boldly rise, new suns beneath,
 The tender vine puts forth her flexile wreath,
 And freed from chilling blasts and northern shower
 Spreads without fear, each shoot, and leaf, and flower.”

MORE generally this month is characterised by a great increase of warmth and sunshine, while the still increasing power of the sun's rays manifests itself by the rapid advance of vegetation. The leafing season is now general, and is completed, for the most part, by the close of the month with the exception of the mulberry, whose foliage is seldom much advanced before the first week in June. The beauty of natural scenery becomes most attractive, and is much enhanced by the splendid varieties of cloud which adorn the sky.

As in April, so in this month, our climate is subject to great vicissitudes of temperature. It was a cold month in the years 1845, 1855, 1877, and 1879. In the latter instance vegetation was very generally injured, more especially the fruit, cereal, and hop crops.

It was a warm month in the years 1847, 1857, 1862, 1868, 1878, and 1882. On May 28th, 1847, the temperature in the shade rose to 87°, and on the 31st to 85°. It was a wet month in the years 1843, 1856, 1860, and 1878. The most prevalent winds are the N.E. and S.W. When easterly winds are prevalent they seriously affect the young and tender foliage, which suffers also from the accompanying dewless nights. This month alternates very frequently with September. Being the last month of the spring season, the weather is, for the most part, fine and pleasant for out-door exercise and amusements. Our migratory birds have very generally arrived, and most of them may be heard in full song.

Some butterflies are seen on the wing, after remaining long in the chrysalis state during an inclement season ; also the field cricket, the chaffer or Maybug, the forest fly, and the large female wasp, &c. Bees, too, are very active, and have thrown forth their early swarms.

“Roused by the gleamy warmth from long repose,
 Th’ awakened hive with cheerful murmur glows ;
 To hail returning spring the myriads run,
 Poise the light wing and sparkle in the sun,
 Yet half afraid to trust th’ uncertain sky,
 At first in short and eddying rings they fly,
 Till bolder grown, through fields of air they roam,
 And bear, with fearless hum, their burthens home.”

JUNE.

“A thousand beauties lost to vulgar eyes
 Now to the scrutinising search are spread ;
 The grasses elegant, though not proud robed ;
 The mallow purpling o’er the pleasant sides
 Of pathways green, mixed with the helpless vetch
 That climbs for aid. Deceitful nightshade dressed
 In hues inviting. Every splashy vale,
 Each dry, entangled copse, enpurpled glows
 With orchis blooms ; while in the moistened plain
 The meadow sweet its luscious fragrance yields.
 And then what odours from the hedgerow breathe
 When the soft shower calls forth the hidden sweets !
 The clover richly feeds the stealthful gale ;
 The strawberry, blushing, hides its modest face
 Beneath the mantling leaves.”

BIDLAKE.



THE first of our three summer months is usually characterised from its commencement by a considerable increase of temperature. In rare instances only do we find summer attained before this date. The N.E. wind of the spring months now retires before that from the westward. Vegetation proceeds most rapidly towards perfection, and, by many, the general appearance of the landscape is considered to be the most beautiful of any period of the year. The dews are

frequently very heavy, and compensate for the extra evaporation from the soil.

It was a rather cold month in the years 1852, 1855, 1860, 1869, 1871, and 1882. During the last ten years there has not been any frost during this month, on Crowborough Hill, which is much more than can be said of the lower ground surrounding it. The temperature was very high in the years 1846, 1857, 1858, 1866, and 1877. A marked feature in the temperature is that in a series of years it departs very little from the average.

The month was very wet in the years 1852, 1860, 1871, 1872, and 1879; and very dry in the years 1844, 1858, 1870, and 1877. In 1844 the severe drought which commenced in April and May continued, with the exception of a few trifling showers, throughout the month of June. Accounts from all parts of the country represented the pasturage as being very seriously affected, and presenting a most sterile appearance. The wheat crop, as in almost every instance of drought in the spring months, alone maintained a healthy condition. The old proverb which says that "Drought never bred dearth in England" is generally correct. The driest June on record was that in the year 1858, but the drought was confined to that particular month. In June, 1852, after a considerable drought in the spring, rain fell more or less on 23 days, and the total amount was upwards of seven inches, while in the neighbourhood of Lewes it was nearly eight inches. This was the largest rainfall which had occurred in June during the present century. It has been observed that from Midsummer day, to the end of the first week in July, we have rather showery weather, with occasional thunderstorms; facts which should be taken into consideration by the farmer.

Few birds continue their song after the end of this month. The yellow hammer, goldfinch, and golden-crested wren may chirp sometimes. The cuckoo's note also ceases. Innumerable insects are called into life by the heat of this month, and afford an endless amusement to the admirer of Nature's works. Many of these minute creatures are discovered only by the aid of the microscope, and are alluded to by Cowper in the following beautiful lines :—

“How sweet to muse upon His skill displayed
 (Infinite skill !) in all that He has made ;
 To trace in Nature's most minute design
 The signature and stamp of Power Divine ;
 Contrivance exquisite, expressed with ease,
 Where unassisted sight no beauty sees
 The shapely limb and lubricated joint
 Within the small dimensions of a point ;
 Muscle and nerve miraculously spun,
 His mighty work, who speaks, and it is done ;
 Th' invisible in things scarce seen revealed ;
 To whom an atom is an ample field !”

The grasshopper now makes its appearance, called by the ancients “sweet prophet of the summer,” and held in great esteem by them. They were regarded by all as the happiest and most innocent of creatures—not, we will suppose, for the reasons given by Xeuarchus when he says—

“Happy the Cicadas' lives,
 Since they all have voiceless wives.”

Towards the end of this, and during the whole of the two subsequent months, myriads of nocturnal creatures may be found moving about, at their vocations, if by chance we seek them by the aid of a lantern—creatures which are never seen during the light of day.

Some will be found preying upon others—some feeding

upon their favourite plants—some committing depredations upon our choice flowers, while all, or nearly all of them, hurry away at our approach. A tithe of the insects which carry on their active pursuits during the deep silence of the night, would be too numerous to mention here—nevertheless, we may observe that the most conspicuous insect, the female glow-worm, which somewhat resembles a caterpillar, possesses the wonderful faculty of being able to extinguish its signal light on the approach of a nocturnal bird, and can also, at will, trim its lamp with great brilliancy. The male, on the contrary, is a winged creature, rarely met with. It also emits a dim light, on flying, from four luminous spots, and the head is surrounded with a horny plate which impedes lateral and upward vision.

JULY

“Calls forth the labouring hinds ; in standing rows,
 With slow approaching step and levelled stroke,
 The early mower bending o’er his scythe,
 Lays low the slender grass ; emblem of man,
 Falling beneath the ruthless hand of Time.
 Then follows blithe, equipped with fork and rake,
 In light array the train of nymphs and swains ;
 Wide o’er the field, their labour seeming sport,
 They toss the withering herbage. Light it flies ;
 The grateful sweetness of the new mown hay,
 Breathing refreshment, fans the toiling swain,
 And soon the jocund dale and echoing hill
 Resound with merriment. The simple jest,
 The village tale of scandal, and the taunts
 Of rude, unpolished wit, raise sudden bursts
 Of laughter from beneath the spreading oak,
 Where thrown at ease, and sheltered from the sun,
 The plain repast and wholesome beverage cheer
 Their spirits.”

OLD POEM.



F all the months of the year July is the warmest. The winds are generally from the westward, but in very hot seasons an easterly current will sometimes prevail for a few days, which opposes the upper current of air from the westward, and eventually causes severe thunder storms. Should the storm be violent, and extend over a large area, the weather becomes cooler for a fortnight or more; and when it happens towards the end of July, so great a change occurs that we have no return of really hot weather. Some of the most beautiful forms of cloud may be seen during this month, especially the cirrus, cirro-cumulus, and cumulo-stratus, which reminds us of the following lines by Bloomfield:—

“There views the white-robed clouds in clusters driven,
And all the glorious pageantry of Heaven,
Low on the utmost bound’ry of the sight,
The rising vapors catch the silver light:
Thence Fancy measures, as they parting fly,
Which first will throw its shadows on the eye,
Passing the source of light, and *thence* away,
Succeeded quick by brighter still than they;
For yet above these wafted clouds are seen
(In a remoter sky, still more serene)
Others detached in ranges through the air,
Spotless as snow, and countless as they’re fair;
Scattered immensely wide from east to west,
The beauteous semblance of a Flock at rest.
These, to the raptured mind, aloud proclaim
Their mighty Shepherd’s everlasting Name.”

The excessive evaporation from the soil causes enormous masses of condensed vapour to be formed at no great distance from the earth. These constitute the latter variety of cloud, which is always present during heavy showers, and,

when congregated, generally discharge themselves in actual thunder storms.

It was a very hot month in the years 1847, 1852, 1859, 1870, 1876, 1878, and 1881. In the last instance the temperature was supposed to have been higher than was ever recorded in England. Such, however, was not the case, as the temperature was *higher* over the South of England in July, 1847, when for three consecutive days the temperature was considerably above 90°—viz., 13th 95°, 14th 98°, and 15th 93°!

The month was gloomy and cold in the years 1845, 1860, 1862, 1867, 1875, 1879, and 1882. An excessive rainfall occurred in 1865, 1875, 1879, and 1882 to the great injury of the cereal crops. On the other hand the month was remarkably dry in the years 1847, 1852, 1863, 1864, 1869, and 1876. In 1869 the drought was very unusual, and only two slight showers fell during the entire month.

In early seasons the harvest has commenced about the 15th, but it commences more usually about the end of this month or in the first week in August. The weather is often showery during the first ten days, and therefore unfavourable for the completion of hay harvests in those seasons when much rain has fallen just after Midsummer day. Should a storm be unusually severe, and the clouds at a considerable elevation, large hail, or flattened pieces of ice, will fall and commit great havoc among the crops of corn, hops, hot-houses, &c. This precipitation differs materially from that which occurs in the ordinary cold showers of March and April.


Notwithstanding this is the warmest month of the year, most of the feathered tribe have nearly discontinued their notes. Fresh flowers, in their natural order of succession, come into bloom as the season advances; while those which adorned the fields in May and June hasten to ripen their seed.

The common snake may frequently be seen crossing the dusty road in sultry weather. This reptile having no fang is perfectly harmless; nevertheless, every opportunity is generally taken of killing it. It feeds on insects, field mice, harvest mice, and many pests of the field, and should, therefore, be considered rather as a friend than a foe. The common bat is now very busy in warm weather, and destroys an enormous number of annoying insects, many tribes of which are now in full vigour.

AUGUST.

"Here once a year, distinction lowers her crest;
 The master, servant, and the merry guest,
 Are equal all; and round the happy ring
 The reaper's eyes exulting glances fling,
 And warmed with gratitude he quits his place,
 With sunburnt hands and ale enlivened face,
 Refills the jug, his honoured host to tend,
 To serve at once the master and the friend;
 Proud thus to meet his smiles, to share his tale,
 His nuts, his conversation, and his ale."

BLOOMFIELD.

N this, the last month of summer, we find its mean temperature, upon the average, to be less than that of July, yet in some years the greatest heat is not attained till this month. The high temperature *at night* constitutes a peculiar feature of this period. By the middle of the month the soil becomes so much heated by the continuance of summer heat that after a fall of rain a rapid evaporation occurs from the surface, and the atmosphere, thus loaded with moisture, becomes exceedingly oppressive. The maximum temperature in the shade is generally very

uniform, and differs but slightly from that of the previous month. Westerly winds are the most prevalent, with but little variation. With respect to thunder storms, the action of the wind is much the same as last month, and severe storms occasionally occur in different parts of the country. The beautiful scenery displayed among the ever-changing clouds is equal to that of the other summer months, and enhances the prospect in the now matured landscape. It was a very hot month in the years 1842, 1846, 1856, 1857, 1871, 1880, and 1884. In 1842 the heat was excessive, and on several days the temperature in the shade was 90° and upwards. There had not been any rain in July, and the surface of the ground had become so hard and dry, that reflected solar heat influenced that in the shade. During the first four days of August, 1856, the daily highest temperature ranged from 90° to 92° in the shade. This month was also very hot in the year 1857, and was supposed to have been the hottest August (1842 excepted) since the year 1780.

It was a cool month in the years 1845, 1848, 1860, and 1864. On the 10th in 1848 a frost occurred, after some showers of rain and snow had fallen during the day, and on the following morning the corn was found frozen in the sheaves, an unprecedented recorded occurrence in the South of England. The rainfall, upon the average, exceeds that for July, which is partly to be attributed to the large quantity which falls in thunder showers. It was, however, a particularly wet month in the years 1852, 1860, 1878, 1879, 1881; and very dry in the years 1849, 1855, and 1880. Harvest now becomes general, and in forward seasons hop-picking commences during the last week.

About the middle of the month the swift takes its departure to more southerly regions. Various birds, as the finches,

linnets, lapwings, &c., congregate—and the note of the red-breast is heard again.

The number of plants in flower is much lessened; but the waste lands are now brilliant with the varieties of Heath which grow in great profusion and luxuriance, viz., *Erica tetralix*, *E. cinerea* and *Calluna Vulgaris*. Of these kinds many shades of colour may be detected, and I have found occasionally the white variety of *E. tetralix* and *E. cinerea*. In some of the bogs may be found *Hypericum elodes*, *Malaxis paludosa*, *Scutellaria minor*, *Drosera rotundifolia*, &c., while on the Heath and other plants may be observed the beautiful parasite *Cuscuta Europæa*.

The common glow-worm, “the little planet of the rural scene,” may be noticed in some abundance; and I will here remark that it is not only the glow-worm which loses its lustre by the light of day. There is a centipede, which infests our greenhouses, whose presence may be detected by its bright phosphorescence at night. There is also a peculiarly reddish-looking worm which is not only luminous in itself, but leaves a trail of phosphorescent light in damp weather.

The delightfully calm and warm evenings which are usual in this season of the year have been admirably described by an American poet.

“All, all was still—

As if the earth now slept to wake no more :
In such a scene the soul oft walks abroad,
For SILENCE is the energy of GOD !
Not in the blackest tempest’s midnight scowl,
The earthquake’s rocking or the whirlwind’s howl,
Not from the crashing, thunder rifted cloud
Does His immortal mandate speak so loud,
As when the *silent night* around her throws
Her star bespangled mantle of repose ;

And as all nature sleeps in tranquil smiles,
 What sweet yet lofty thought her soul beguiles !
 There's not an object 'neath the moon's bright beam,
 There's not a shadow darkening on the stream,
 There's not a star that jewels yonder skies,
 Whose bright reflection on the water lies,
 That does not in the lifted mind awake
 Thoughts that of love and heaven alike partake."

SEPTEMBER.

" When is the aspect which Nature wears
 The loveliest and dearest ? Say, is it in Spring ?
 When its blossoms the apple tree beautifully bears
 And birds on each spray are beginning to sing ?
 Or is it in Summer's fervid pride ?
 When the foliage is leafy on every side,
 And tempts us at noon in the green-wood to bide,
 And list to the wild bird's warbling ?

" Lovcly is Nature in seasons like these ;
 But lovelier when *Autumn's* tints are spread
 On the landscape round ; and the wind-swept trees
 Their shady honours reluctantly shed ;
 When the bright sun sheds a watery beam
 On the changing leaves and the glistening stream ;
 Like smiles on a sorrowing cheek, that gleam
 When its woes and cares for a moment are fled."

B. BARTON.



SEPTEMBER, the first of the autumnal months, is very variable in its character. In some years it has been like one of the spring months, while in others it has proved the hottest month of the year, with brilliant skies and great drought. The mean temperature is materially

affected by the reduction in the length of day ; nevertheless, in warm autumns, after a rather cool season, its general character is that of true summer. When the month is fine there is not a more delightful period of the year on account of that peculiar softness and serenity of atmosphere, which is seldom experienced in any other month. In such seasons the equinoctial gales are usually deferred till October. It was a very warm month in the years 1843, 1846, 1857, 1858, 1865, 1875, 1880, and 1884. September, 1843, was an extraordinary instance of late summer-like heat. On the first day the temperature rose to 90° in the shade : on the 2nd, 87° ; and on ten other days the highest daily temperature ranged from 80° to 85.5° . I believe there is no other instance on record of such continued heat at this period of the year. The heat of September, 1846, was a continuance of the great heat of the two previous months, and it was not till the morning of the 29th that there was any warning of autumn's approach. The daily temperature during the first three weeks ranged from 70° to 82.5° , and at night it very rarely fell below 50° till the 29th. No rain fell during the first three weeks.

Another remarkable instance of splendid weather in September occurred in the year 1865. With the exception of a very slight shower on the 21st no rain fell during the month, while on fifteen days the sky was absolutely cloudless. It was a somewhat cold month in the years 1845, 1847, 1860, 1863, and 1877 ; hence, it is oftener warm than otherwise. A crisis generally occurs about the time of the equinox, and wherever the wind happens to be at that time, from it we may frequently determine the character of the weather during the ensuing quarter. Westerly winds are by far the most frequent, but they occasionally yielded to those from

the N.E. In the course of a long series of years the rainfall is found to be heavier during the Autumn than at any other season of the year, but September is the driest of the three months..

Very few of our indigenous plants come into bloom this month.

Towards its close the swallow takes its departure from us.

“Amusive birds! say where your hid retreat,
When the frost rages and the tempests beat;
Whence you return, by such nice instinct led,
When Spring, sweet season, lifts her bloomy head?
Such baffled searches mock man’s prying pride,
The God of Nature is your secret guide.”

Some birds at this season resume their song after a temporary silence

“The Thrush, the Blackbird, and the Woodlark now,
Cheerer of night, their pleasing song resume;
The Stone Curlew his chattering note repeats;
And the Woodlark continual breaks the depth
Of sylvan darkness with discordant moans.”

The phenomena attendant upon sunrise and sunset, at this season of the year, are well worthy our attention, for it is certain that we nowhere meet with a more pleasing show of Nature than at this time. The richest decoration that human fancy can imagine must sink into insignificance when compared with a spectacle in which radiance and beauty are so pre-eminent.

OCTOBER.

"And when the fields with scatter'd grain supply
 No more the restless tenants of the sty,
 From oak to oak they run with eager haste,
 And, wrangling, share the first delicious taste
 Of fallen acorns ; yet but thinly found
 Till the strong gale has shook them to the ground.
 It comes, and roaring woods obedient wave.
 Their home, well pleased, the joint adventurers leave ;
 The trudging sow leads forth her numerous young,
 Playful, and white and clean, the briers among,
 Till briers and thorns increasing, fence them round,
 Where last year's mould'ring leaves bestrew the ground,
 And o'er their heads, loud lashed by furious squalls,
 Bright from their cups the rattling treasure falls ;
 Hot, thirsty food, whence doubly sweet and cool,
 'The welcome margin of some rush-grown pool."

BLOOMFIELD.



OCTOBER is frequently stormy and wet. The decrease of temperature is considerable, being more than six degrees less than September ; nevertheless, the month is often warm, considering the shortness of the days, thus compensating for the cold of the longer days in April and May. After heavy rains the sky is particularly blue, and in warm seasons is dotted with the beautiful cirro-cumulus cloud. The gossamer web decks the hedges and stubble of the cornfields, indicating thereby a further continuation of fine weather. On some of the finest evenings we still have some beautiful sunsets, and a deep rosy tint extends far along the horizon. The first frosty mornings now occur, which are often the precursors of rain. Thunder storms rarely happen, unless the first half of the month has been warmer than usual.

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During the latter half of the month gales of wind are frequent from S.W., which cause considerable depressions of the barometer, and a low mean daily reading. The cause of this depression is supposed to originate from the great change of temperature which usually takes place towards the end of the month. Hence there is a loss of balance in the amount of vapour contained in the equatorial and polar currents. When the latter gains any amount of vapour, which the former loses, the exchange will perhaps account for the great rainfalls and the frequent gales of wind with which we are visited at this season of the year. Instances of unusual warmth occurred in the years 1847, 1851, 1856, 1857, 1861, 1874, 1876, and 1878. On October 12th, 1847, the highest temperature in the shade was as much as 71° . This month continued very warm throughout, with a great prevalence of westerly wind, and a moderate rainfall. October, 1856, was a warm and pleasant month, when the average highest daily temperature was upwards of 62° , and it frequently ranged between 65° and 68° during the second and third weeks. In October, 1857, the heat was unusually great, and on three days the maximum temperature in the shade ranged between 70° and 74° , while it was 72° so late as the 16th. The warmest October, however, was that in the year 1861, when the mean temperature was 4.5° above the average. On four days the temperature in the shade was 70° and upwards. N.E. winds were prevalent, and the rainfall was below the average. Cold weather prevailed in the years 1842, 1844, 1850, 1867, and 1881. In 1842 severe frosts occurred on eleven nights, and on the mornings of 21st and 22nd the temperature fell 12 degrees below the freezing point, while frosty afflorescence on the windows reminded us of mid-winter. In some parts of England the cold was even more

severe than in Sussex. The mean temperature of October, 1844, was more than four degrees below the average. October, 1850, was also very cold, and the mean temperature was nearly six degrees below the average. October, 1867, was almost as cold as the previous instance, and unusually severe frosts were recorded during the first fortnight. On the morning of the sixth the temperature of radiation was fifteen degrees below the freezing point.

The chief meteorological feature in the month of October is the great rainfall, which exceeds that of any other month. On rare occasions snow falls to a considerable depth. Each season furnishes its own enjoyments, if we can but realize them, and there are accompaniments to that of autumn which are singularly impressive. It is, however, the woodlands which now exhibit the most strongly-marked character. Many of the mossy and fungoid tribes are in their full luxuriance and beauty, so that even the fallen stem of an old oak becomes a landscape, and, as an old poet says—

“Oft the small plant layeth
Its fairy gem beside the giant tree.”

The curious forms of lichen are now well worth observing, as they present an endless variety of appearance. About the middle of the month the common marten disappears, also the sand-marten. The common swallow and wagtail finally take their departure.

For the most part this month is devoid of floral attractions, but fruits and seeds claim our attention.

The hedges are bright with the cheerful colours of the holly and privet, which tend to compensate for the departing foliage.

NOVEMBER.

“ Look Nature through, ’tis révolution all ;
 All change ; no death. Day follows night, and night
 The dying day ; stars rise, and set, and rise ;
 Earth takes th’ example. See the summer gay,
 With her green chaplet and ambrosial flowers,
 Drops into pallid autumn ; winter gray,
 Horrid with frost, and turbulent with storm,
 Blows autumn and his golden fruits away :
 Then melts into the spring ; soft spring, with breath
 Favonian, from warm chambers of the south,
 Recalls the first. All to re-flourish, fades ;
 As in a wheel, all sink to re-ascend ;
 Emblems of man, who passes, not expires.”

YOUNG.



NOVEMBER is generally a very dreary month, and, with a few exceptions, the atmosphere is for the most part unsettled, gloomy, and damp. The S.W. wind is prevalent, and most of the heaviest gales of wind on record have occurred in this month. A sudden decrease of temperature may at any time be expected, with sharp frosts and slight falls of snow ; but very severe frosts seldom commence till the last week, and are not usually of long continuance. Although the month is characterised by a general cloudiness of sky, and a considerable number of wet days, yet great variation is observed in the actual amount of rainfall. In a series of years the mean quantity exceeds that for September, but is less than that for October. Instances of unusual warmth in November occurred in the years 1846, 1847, 1852, 1857 and 1881. During the first week in November, 1846, the temperature was at or above 60° on three days, and up to summer heat in the full rays of the sun. In November, 1847, the temperature of the two first days was remarkably high—higher, indeed, both in the shade and in

the sun than on several days in the months of May and June. This high temperature, accompanied by genial winds, continued both day and night to the 17th, when the first sensible diminution of warmth was observed in consequence of the wind blowing suddenly, and with some violence, from the northward. November, 1852, was remarkable for high temperature, slight thunder storms, gales of wind, heavy rain and floods. November, 1857, was also very warm. The mean temperature was nearly three and a half degrees above the average.

Very cold weather seldom prevails in the southern counties during November, but a remarkable instance occurred in the year 1851, when the cold was greater than had been experienced in this month since the year 1786. It was also a cold month in the years 1861, 1867, 1871 and 1879. Our forest trees generally lose their leaves by the first week, and should a sudden frost occur, after a wet day, the foliage falls to the ground very suddenly; nevertheless the woodlands, here and there, exhibit a beautiful variety of rich mingling hues.

Nearly all our summer and autumnal flowers are gone save a very few in some sheltered spots, but in their absence the bright green of the ivy, holly and mosses stand forth in all the vividness and freshness of a new vegetation.

The various kinds of fungi are now very abundant, and there is much to admire in their elegance of form and varying tints.

Great quantities of winter birds now hasten to our comparatively warmer region. The woodpigeon, the latest of the winter birds, arrives. The various tribes of insects seek their winter quarters. The more tender burrow in the earth, beneath the reach of frost, and as the cold increases, their animal functions appear to cease, so that they require neither food nor air. It is very pleasing to consider with what extraordinary instinct all these insects are provided for the purpose

of their self-preservation during an inclement season, so that when plants cease to grow, and flowers to blossom, they require neither the protection of the one, nor the juices of the other.

DECEMBER.

“Where waves the leaf,
Or rings with harmony the merry vale?
Day's harbinger no song performs, no song
Or solo anthem deigns sweet Philomel.
The golden woodpecker laughs loud no more.
The pye no longer prates, no longer scolds
The saucy jay. Who sees the goldfinch now
The feathered groundsel pluck, or hears him sing
In bower of apple blossoms perched? Who sees
The chimney-haunting swallow skim the pool,
And quaintly dip, or hear his early song
Twittered to dawning day? All, all are hushed.
The very bee her merry toil foregoes,
Nor seeks her nectar to be sought in vain.
Only the solitary robin sings,
And, perched aloft, with melancholy note,
Chaunts out the dirge of autumn. Cheerless bird,
That loves the brown and desolated scene,
And scanty fare of Winter.”

OLD POEM.

WHEN we examine the tables of temperature a considerable variation is found in that for this month; thus in 1879 it was 32.°, and in the next year 41.7°, and upon the average of the last eleven years it has equalled that for January. Generally this month may be said to be mild and rather stormy, for the real severity of winter seldom commences before the last week, while the month and year expire either in gloomy, damp weather, or in a state of frost and snow, according to the prevailing character of the season during the few previous weeks. If the month

should prove mild a considerable quantity of rain frequently falls, but if cold it is almost invariably dry.

The direction of the wind varies as much or more than in any other month. Should the S.W. prevail the atmosphere is very much disturbed by severe storms of wind, heavy rain, and even lightning and thunder; but if north, settled frost accompanied by heavy snow may occur, even at the beginning of the month. The gales from the westward are now and then very heavy, accompanied by a great depression of the barometer. It was a very mild month in the years 1843, 1852, 1857, 1868 and 1876.

On the morning of Christmas Day, 1868, the thrush and lark were singing as in early spring, and swarms of guats were observed in sheltered situations.

On the other hand December was a very cold month in the years 1844, 1846, 1855, 1878 and 1879.

In 1844 the cold was more severe than had been known in December since the year 1788, when the mean was eight degrees below the average.

As a rule the month of December is very dreary and unpleasant; "but every medal has its reverse."

Whatever may be experienced from the cold, dreary days and long nights of winter, all is compensated for by the cheerful sunlight of spring and the lively associations connected with it. Some birds and quadrupeds have retired to their winter conditions and concealment, from which not even the calls of hunger appear to force them. Even the hedgehog, to which Mr. C. Smith alludes in the following lines, is in a torpid condition.

"Wherefore should man or thoughtless boy
Thy quiet harmless life destroy,
Innoxious urchin?—for thy food
Is but the beetle and the fly,
And all thy harmless luxury
The swarming insects of the wood.

“Should man, to whom his God has given
Reason, the brightest ray of heaven,
Delight to hurt, in senseless mirth,
Inferior animals?—and dare
To use his power in waging war
Against his brethren of the earth?

“Poor creature! to the woods resort,
Lest, lingering here, inhuman sport
Should render vain thy thorny case;
And whelming water, deep and cold,
Make thee thy spiny ball unfold,
And show thy simple negro face!”

The whole race of insects which filled our pathways with life and motion are now either buried in sleep or actually no longer exist, except in the unformed rudiments of a future progeny. Winter, however, has its charms and usefulness; in fact, the reduction of temperature and its accompaniments are absolutely necessary for our English constitutions. Let the consideration, then, of the unspeakable advantages which we enjoy in our island home not only banish every repining thought that we are not placed in still milder regions and serener skies, but teach us to regard the Divine Being with ever increasing love and unceasing adoration.

“NATURE never did betray
The heart that loved her; 'tis her privilege
Through all the years of this our life, to lead
From joy to joy; for she can so inform
The mind that is within us, so impress
With quietness and beauty, and so feed
With lofty thoughts, that neither evil tongues,
Rash judgments, nor the sneers of selfish men,
Shall e'er prevail against us, or disturb
Our cheerful faith, that all which we behold
Is full of blessings.”

WORDSWORTH.

